

01 11 00 SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Project description.
 - 2. Contractor's use of site and premises.

1.02 PROJECT DESCRIPTION

- A. Work of this Project is described as the construction of a timber boardwalk and associated appurtenances. It is entitled "**Church Avenue Reconstruction Project – Phase 1**" and is located on Church Avenue, Northbridge, MA.

Work includes the removal and installation of water and sewer main with associated appurtenances along a portion of Church Avenue.

- B. Alternates.

There are no alternates as part of this project.

- C. Scope of Work.

- 1. Trench excavation.
- 2. Removal and disposal of $2,123 \pm$ LF of sanitary sewer main.
- 3. Removal and disposal of $1,000 \pm$ LF of water main.
- 4. Removal of up to 4 fire hydrants and valve assemblies.
- 5. Reconstruction of up to 12 sewer manholes.
- 6. Installation of $2,123 \pm$ LF of sanitary sewer main.
- 7. Installation of $1,000 \pm$ LF of water main and appurtenances.
- 8. Installation of 4 fire hydrants and appurtenances.
- 9. Installation of temporary asphalt patch.

Refer to the drawings and technical specification sections for the full scope of work.

1.03 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Contractor shall have complete and exclusive use of site and premises for execution of the Work.
- B. Assume full responsibility for protection and safekeeping of products under this Contract stored on site.
- C. Obtain and pay for use of any additional storage or work areas needed for operations.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION – 01 11 00

01 22 00
UNIT PRICES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section covers those items for which indefinite quantities can be expected and, therefore, pre-agreed prices per unit of work are established as means to determine adjustments to the Contract Price after actual quantities are determined.

1.02 RELATED REQUIREMENTS

- A. Refer to Section 00 72 00 – GENERAL CONDITIONS for limitations.
- B. Examine Contract Documents for requirements that affect work of this Section.

1.03 ADDITIONAL REQUIREMENTS

- A. Should additional items of work to those listed herein occur, with a need for adjustments to the contract price, the supplemental unit prices for such categories of work shall be as published in the current issue on the date of contract award of Means Cost Data published by R.S. Means Co., Inc.
 - 1. The Owner may choose not to approve any or all unit prices prior to Award of the Contract if it deems the Unit Price unreasonable. In this case, the change order process described in Article 12 of the General Conditions, and other Sections, will be used for Work described in the Unit Price Schedule, when any change of the base contract scope is required.
- B. Stated unit prices shall cover all costs, and the prices given shall represent the exact amount per unit to be paid the Contractor (in the case of additions or increases) or to be refunded the Owner (in the case of decreases). No additional adjustment will be allowed for overhead, profit, insurance, compensation insurance or other direct or indirect expenses of Contractor or Subcontractors. Except as otherwise provided in the Contract, there shall be no adjustment for inflation or other indirect cause in unit prices.
- C. No allowance will be made for any increased expenses, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly or indirectly from the adjustment of work scope throughout the use of unit prices, or from elimination or complete omission of items, or from unbalanced allocation among the contract items of overhead expense on the part of the Contractor and subsequent loss of reimbursement therefore, or from any other cause.
- D. Prior to commencing removal of materials or placement of materials or other work set forth in the schedule of unit prices as unit price items, the Contractor shall notify the Owner's Project Manager in sufficient time to permit proper measurements to be taken on behalf of the Owner. Only quantities which have been approved in writing by the Owner's Project Manager will be considered in the determination of adjustment to the Contract Sum on the unit price basis.
- E. Performance of work which is not required under the Contract Documents or which is not authorized by change order or other directive of the Owner's Project Manager, whether or not such work items are set forth hereunder as a unit price item, shall not be considered cause for any extra payment on account of the Contract. The Contractor will be held fully responsible for such unauthorized work, including the performance of all corrective measures required.

- F. General bidders and each sub-bidder shall provide only one number in the Bid Forms. The same number will be used for additive unit prices and deductive unit prices.
- G. Refer to individual Specification Sections for further description of construction activities requiring the establishment of unit prices.

1.04 QUANTITIES AND COST ADJUSTMENTS

- A. Refer to individual Specification Sections for methods of measurement and payment for unit prices. As soon as the work involved in each unit cost item has been completed, submit documentation to establish the actual quantities provided. Submit to the Owner's Project Manager for review and issuance of Change Order.
- B. Change Order amount for each unit cost item will be based on actual quantities multiplied by the unit cost. This unit cost includes all mark-ups applicable taxes, overhead, and profit as described below.

1.05 METHOD OF MEASUREMENT OF EARTH EXCAVATION

- A. Where concrete or gravel fill under foundations is required, the excavation will be computed to the bottom of such foundations.
- B. No payment will be made for the excavation of well or coupling holes.
- C. Excavation outside the specified lines, whether due to slides or other causes, or made for any reason, will not be paid for. Any material sliding into the excavation shall be removed by the Contractor at his own expense.
- D. Basis of Payment: The unit prices per cubic yard for excavation shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work, except shoring and bracing required by state and local codes.

1.06 ROCK EXCAVATION

- A. Material to be excavated is assumed to be earth and other materials that can be removed by power excavation equipment. The following items, if they can be removed by power excavation equipment and require the use of drills or explosives, are defined as rock excavation, (a) rock or stone in original ledge; (b) hard shale in original ledge; (c) boulders over one (1) cubic yard.
- B. When during the process of general excavation rock is encountered, uncover and expose it and notify the Owner's Project Manager before proceeding further. The areas in question shall then be cross-sectioned as specified. Any rock removed prior to notification to the Owner's Project Manager and the subsequent cross-sectioning shall be considered "general excavation" and unit price bid for rock excavation shall not apply.
- C. Carefully examine rock excavation for foundations and remove loose or shaken rock down to all solid bearing; level the rock surface or shelf it to a slope not exceeding 1" per foot or as directed, leaving no undrained pockets in the surface.
- D. Remove all excavated rock from the site and legally dispose of same.
- E. Blasting: Obtain written permission and approval of method from local or other authorities having jurisdiction before proceeding with rock excavation. Store, handle and employ explosives in accordance with state and local regulations or, in the absence of such, in accordance with the provisions of the Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc.

In general, no blasting will be allowed within 100 feet of new or existing construction. Notify the Owner's Project Manager at least 48 hours before any intended blasting and do no blasting operation until the Owner's Project Manager has had the opportunity to perform an inspection. However, such inspection shall not relieve the Contractor of any of his obligations or liabilities under the Contract. Cover all rock blasting with heavy mats or timber chained together and do no damage to existing buildings, foundations, and glazed areas. Repair any damage caused by this work to the full satisfaction of the Owner. Use time delay fuses where possible to reduce shock.

- F. If any part of the rock excavation at footings is carried beyond the depth and the dimensions indicated on the Drawings or called for in the Specifications, the Contractor shall, at his own expense, furnish and install concrete of the same strength as footings to the required level. Where rock excavation is carried below depths and dimensions indicated or specified at other areas, the Contractor shall at his own expense furnish and install compacted fill, as specified herein, to the desired level.
- G. Method of Measurement: The quantity of rock excavation to be paid for by the Owner under this item will be the number of cubic yards of rock excavation measured in its original position.
- H. Basis of Payment: The unit price bid per cubic yard for this item shall include the cost of furnishing all labor, materials and equipment necessary to complete the rock excavation work.

1.07 UNIT PRICES

- A. Should certain additional work be required, or should the quantities of certain classes of work be increased or decreased from those required by the Contract Documents, by authorization of the Owner, the below unit prices shall, at the option of the Owner, be the basis of payment to the Contractor or credit to the Owner, for such increase or decrease in the work. The Unit Prices shall represent the exact net amount per unit to be paid the Contractor (in the case of additions or increases) or to be refunded the Owner (in the case of decreases). No additional adjustment will be allowed for overhead, profit, insurance, or other direct or indirect expenses of the Contractor or Subcontractors. No additional adjustments will be allowed for over excavation, over blasting, or other work without the prior written approval of the Owner.
- B. The unit prices shall include all labor, materials, dewatering, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for. Changes shall be processed in accordance with the provisions of the GENERAL CONDITIONS governing Changes in the Work and Section 01 26 00, CONTRACT MODIFICATION PROCEDURES.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION – 01 22 00

01 25 00
SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A Section Includes:

1. Product Substitution Procedures.

1.02 GENERAL

A Definition: Proposal by Contractor to use manufacturer, product, material, or system different from ones approved in Contract Documents.

B Do not substitute Products unless a substitution request has been approved by Owner's Project Manager.

C Substitutions during Bidding: Refer to Instructions to Bidders.

1.03 SUBSTITUTION REQUESTS

A Submit substitution requests on Contractor's standard form.

B Document specified product and proposed substitution with complete data, including:

1. Product identification, including name and address of manufacturer.
2. Product description, performance and test data, and reference standards.
3. Sample, if requested.
4. Description of any anticipated effect that acceptance of proposed substitution will have on Progress Schedule, construction methods, or other items of Work.
5. Description of any differences between specified product and proposed substitution.
6. Difference in cost between specified product and proposed substitution.

C Burden of proof for substantiating compliance of proposed substitution with Contract Document requirements remains with Contractor.

D A request constitutes a representation that the Contractor:

1. Has investigated the proposed Product and determined that it meets or exceeds the quality level of the specified Product.
2. Will provide the same warranty for the substitution as for the specified Product.
3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Will reimburse Owner for design services associated with re-approval by authorities or revisions to Contract Documents to accommodate the substitution.

E Substitutions will not be considered if:

1. They are indicated or implied on Shop Drawings or other submittals without submittal of a substitution request.
2. Approval will require substantial revision of Contract Documents without additional compensation to Owner's Project Manager.

F Submit electronically in Adobe PDF format.

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- 6. Owner's Project Manager will notify Contractor of approval or rejection of each Substitution Request.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION – 01 25 00

SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements required for handling Contract Modifications including, but not limited to:

1. Preliminary procedures.
2. Documentation of proposals and claims.
3. Preparation of Change Orders.

1.02 RELATED REQUIREMENTS

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. GENERAL CONDITIONS and Document 00 73 00, MODIFICATIONS TO GENERAL CONDITIONS: Methods of determining cost or credit to Owner resulting from changes in Work made on a time and material basis, and Contractor's claims for additional costs.
2. Section 01 33 00, SUBMITTAL PROCEDURES.
3. Section 01 60 00, PRODUCTS
4. Section 01 77 00, CLOSEOUT PROCEDURES

1.03 DEFINITIONS

A. Change Order: See the GENERAL CONDITIONS.

B. Construction Change Authorization: A written order to the Contractor, signed by Owner and Owner's Project Manager which amends the Contract Documents as described, and authorizes Contractor to proceed with a change which affects the Contract Sum or the Contract Time, for inclusion in a subsequent Change Order.

C. Owner's Project Manager's Supplemental Instructions: A written order, instructions, or interpretations, signed by Owner's Project Manager making minor changes in the Work not involving a change in Contract Sum or Contract Time.

D. Proposal Request: A request to the Contractor, signed by the Owner's Project Manager, for submission of an itemized quotation for changes in the Contract Sum or Contract Time. This is not a Change Order or a direction to proceed with the Work.

1.04 PRELIMINARY PROCEDURES

A. Owner's Project Manager may initiate change by submitting a Proposal Request to Contractor. Request will include:

1. Detailed description of the Change, Products, and location of the change in the Project.
2. Supplementary or revised Drawings and Specifications.
3. The projected time span for making the change, and a specific statement as to whether overtime work is, or is not, authorized.
4. A specific period of time during which the requested price will be considered valid.
5. Such request is for information only, and is not an instruction to execute the changes, nor

to stop Work in progress.

B. Contractor may initiate changes by submitting a written notice to Owner's Project Manager, containing:

1. Description of the proposed changes.
2. Statement of the reason for making the changes.
3. State of the effect on the Contract Sum and the Contract Time.
4. Statement of the effect on the work of separate contractors.
5. Documentation supporting any change in Contract Sum or Contract Time, as appropriate.

1.05 CONSTRUCTION CHANGE AUTHORIZATION

- A. In lieu of Proposal Request, Owner's Project Manager may issue a Construction Change Authorization for Contractor to proceed with a change for subsequent inclusion in a Change Order.
- B. Authorization will describe change in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change, and will designate the method of determining any change in the Contract Sum and any change in Contract Time.
- C. Owner's Project Manager will sign and date the Construction Change Authorization and send it to the Owner for authorization for the Contractor to proceed with the changes.
- D. Once authorized by the Owner, the Owner's Project Manager will send the Construction Change Authorization to the Contractor. Contractor shall sign and date the Construction Change Authorization to indicate agreement with the terms therein.

1.06 DOCUMENTATION OF PROPOSALS AND CLAIMS

- A. Support each quotation for a lump-sum proposal, and for each unit price which has not previously been established, with sufficient substantiating data to allow Owner's Project Manager to evaluate the quotation.
- B. Provide additional data in detail as acceptable to Owner's Project Manager to support time and cost computations including, but not limited to:
 1. Labor required.
 2. Equipment required.
 3. Products required.
 - a. Recommended source of purchase and unit cost.
 - b. Quantities required.
 4. Credit for work deleted from Contract, similarly documented.
 5. Overhead and profit.
 6. Justification for any change in Contract Time.
- C. Support each claim for additional costs, and for work done on a time-and-material/force account basis, with documentation as required for a lump-sum proposal, plus additional information:
 1. Name of the Owner's authorized agent who ordered the work, and date of the order.
 2. Dates and times work was performed, and by whom.
 3. Time record, summary of hours worked, and hourly rates paid.
 4. Receipts and invoices for:
 - a. Equipment used, listing dates and times of use.
 - b. Products used, listing quantities.
 - c. Subcontracts.

D. Document requests for substitutions for Products as specified in Section 01 60 00, PRODUCT REQUIREMENTS.

1.07 PREPARATION OF CHANGE ORDERS

- A. Owner's Project Manager will prepare each Change Order.
- B. Form: Change Order, AIA Document G701.
- C. Change Order will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change.

1.08 LUMP-SUM/FIXED PRICE CHANGE ORDER

- A. Content of the Change Orders will be based on either:
 1. Owner's Project Manager's Proposal Request and Contractor's responsive Proposal as mutually agreed between Owner and Contractor.
 2. Contractor's Proposal for a change, as recommended by Owner's Project Manager.
- B. Owner and Owner's Project Manager will sign and date the Change Order as authorization for the Contractor to proceed with the changes.
- C. Contractor shall sign and date the Change Order to indicate agreement with the terms therein.

1.09 UNIT PRICE CHANGE ORDER

- A. Content of Change Orders will be based on, either:
 1. Owner's Project Manager's definition of the scope of the required changes.
 2. Contractor's Proposal for a change, as recommended by Owner's Project Manager.
 3. Survey of completed Work.
- B. The amounts of the unit prices to be:
 1. Those stated in the Agreement.
 2. Those mutually agreed upon between Owner and Contractor.
- C. When quantities of each of the items affected by the Change Order can be determined prior to start of the Work:
 1. Owner and Owner's Project Manager will sign and date the Change Order as authorization for Contractor to proceed with the changes.
 2. Contractor shall sign and date the Change Order to indicate agreement with the terms therein.
- D. When quantities of the items cannot be determined prior to start of the Work:
 1. Owner's Project Manager and Owner will issue a Construction Change Authorization directing Contractor to proceed with the change on the basis of unit prices and will cite the applicable unit prices.
 2. At completion of the change, Owner's Project Manager will determine the cost of such work based on the unit prices and quantities used.
 - a. Contractor shall submit documentation to establish the number of units of each item and any claims for a change in Contract Time.
 3. Owner's Project Manager will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.

4. Owner and Contractor will sign and date the Change Order to indicate their agreement with the terms therein.

1.10 TIME AND MATERIAL/FORCE ACCOUNT CHANGE ORDER/CONSTRUCTION CHANGE AUTHORIZATION

- A. Owner's Project Manager and Owner will issue a Construction Change Authorization directing Contractor to proceed with the changes. Verification of labor, material, and equipment must be submitted to the Owner's representative on a daily basis for signature. Failure on the part of the Contractor to procure a signature shall be cause for non-payment.
- B. At completion of the change, Contractor shall submit itemized accounting and supporting data as provided in the Article "Documentation of Proposals and Claims" of this Section.
- C. Owner's Project Manager will determine the allowable cost of such work, as provided in the GENERAL CONDITIONS and Document 00 73 00, MODIFICATIONS TO GENERAL CONDITIONS.
- D. Owner's Project Manager will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.
- E. Owner and Contractor will sign and date the Change Order to indicate their agreement therewith.

1.11 CORRELATION WITH CONTRACTOR'S SUBMITTALS

- A. Periodically revise Schedule of Values and Request for Payment forms to record each change as a separate item of Work, and to record the adjusted Contract Sum.
- B. Periodically revise the Construction Progress Schedule to reflect each change in Contract Time.
 1. Revise subschedules to show changes for other items of work affected by the changes.
- C. Upon completion of work under Change Order, enter pertinent changes in Record Documents.

END OF SECTION

01 26 13

REQUESTS FOR INTERPRETATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including General, Bidding Documents, Contract Forms and Conditions of the Contract, and Division 01 – General Requirements, apply to the work of this Section.
- B. Related Work Specified Elsewhere:
 - 1. Section 01 25 00 – Substitution Procedures
 - 2. Section 01 26 00 – Contract Modification Procedures
 - 3. Section 01 33 00 – Submittal Procedures
 - 4. Section 01 77 00 – Closeout Procedures

1.02 SUMMARY

- A. Section includes:
 - 1. Requests for Interpretation (RFI's)

1.03 GENERAL

- A. Request for Interpretation (RFI): Request from Contractor seeking interpretation or clarification of Contract Documents not involving Substitutions or changes to Contract Sum or Contract Time.
- B. RFI's constitute a request for interpretation only.
- C. Do not submit RFI's:
 - 1. To request approval of Substitutions
 - a. Refer to Section 01 25 00 – Substitution Procedures.
 - 2. To request changes known to include changes to Contract Sum or Contract Time
 - a. Refer to Section 01 26 00 – Contract Modification Procedures.
 - 3. To request approval of submittals
 - a. Refer to Section 01 33 00 – Submittal Procedures.
 - 4. To submit Project Record Documents
 - a. Refer to Section 01 77 00 – Closeout Procedures.

1.04 SUBMITTAL

- A. Submit RFI's electronically via commercially available online project management software.
- B. Include on each RFI:
 - 1. Project name
 - 2. Sequential RFI number
 - 3. Intended Recipient
 - 4. Date submitted
 - 5. Name of Contractor submitting RFI
 - 6. Applicable Drawing sheet and detail numbers or Specification Section numbers
 - 7. If applicable, include date when response is requested within text under "Request."
- C. Review and sign RFI's submitted by Subcontractors, Sub-Subcontractors, or Suppliers prior to submittal to Owner's Project Manager.

- D. Maintain log of RFI's showing RFI number and current status of each RFI.
- E. When RFI's require submittal of drawings, follow submittal procedures specified for Shop Drawings in Section 01 33 00 – Submittal Procedures.
- F. Submit electronically in Microsoft Word or Adobe PDF format.
- G. Promptness:
 - 1. The Contractor is responsible for promptly submitting RFI's upon discovery of the need for interpretation or clarification of the Contract Documents.
 - 2. The Contractor shall not retain or suppress RFI's for group submissions. Each individual RFI is to be submitted expeditiously upon occurrence. Numerous RFI's submitted in a short time period will not be considered reasonable, and will result in review times being extended accordingly.

1.05 UNWARRANTED RFI'S

- A. Confirming RFI's: The Contractor shall not submit Confirming RFI's, requesting confirmation of material already in the contract documents, or previously provided, or requesting confirmation to questions previously answered or clarification previously given.
- B. Repetitive RFI's: The Contractor shall not submit repetitive RFI's, wherein the same interpretation is requested more than once, even if phrased in another format or asked in a different manner.
- C. Confirming and Repetitive RFI's are considered frivolous and may constitute a claim from the Owner representatives (Owner and Owner's Project Manager) against the Contractor.
- D. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Owner's Project Manager for evaluating and responding to:
 - 1. Incomplete, illegitimate, or frivolous Contractor's Requests For Interpretation and requests for interpretation that are not prepared in accordance with the Contract Documents.
 - 2. Contractor Requests For Interpretation where the requested material is available to the Contractor from a careful study and comparison of the contract documents, field conditions, contractor-prepared coordination drawings, other Owner/Owner's Project Manager provided information or prior project correspondence or documentation.
 - 3. Contractor-proposed alternative arrangements or installations for the convenience of the contractor which, upon acceptance, requires the Owner's Project Manager to revise the contract documents.

1.06 OWNER'S PROJECT MANAGER ACTION

- A. Owner's Project Manager will review each RFI, determine action required, and return it. Allow an average of five (5) working days for Owner's Project Manager's response for each RFI. Some issues may take longer for review. The recipient of the RFI shall notify the sender of the RFI if additional time is required.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION – 01 26 13

SECTION 01 29 00

PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment, and supplements provisions, Payments and Completion, of the General Conditions of the Contract, as amended.

1.02 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of the Contractor's Construction Schedule, list of Subcontracts and Submittal Schedule.

1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
 - a. Contractor's Construction Schedule.
 - b. Application for Payment forms, including Continuation Sheets.
 - c. List of subcontractors.
 - d. Schedule of alternates.
 - e. List of products.
 - f. List of principal suppliers and fabricators.
 - g. Schedule of submittals.
2. Submit the Schedule of Values to the Owner's Project Manager at the earliest possible date but no later than ten (10) days before the date scheduled for submittal of the initial Applications for Payment.
3. Subschedules: Where Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.

B. Format and Content Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values. Provide at least one line item for each Specification Section. For major trades with total line items exceeding \$25,000, provide a separate, back-up breakdown of each such trade with line items for identifiable units of work within such trade each of which has a value not exceeding \$25,000.

1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Name of the Owner's Project Manager
 - c. Project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section.
 - b. Description of Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value.
 - h. Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 - i. Phase Area.

3. Provide a breakdown of the Contract Sum by Phase Area and in such detail as the Owner's Project Manager or Owner may require to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Break principal subcontract amounts down into several line items.
4. Round amounts to nearest whole dollar; the total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Application for Payment may include materials or equipment, purchased or fabricated and stored, but not installed.
 - a. Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing, if required.
6. Provide separate line items on the Schedule of Values for initial cost of the materials, for all subsequent stages of completion, and for total installed value of that part of the Work.
7. Unit Price Work: Show the line-item value of unit-cost allowances, as a product of the unit multiplied by the measured quantity. Estimate quantities from the best indication in the Contract Documents.
8. Temporary facilities, clean up and other major cost items and correction of existing conditions are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at the Contractor's option.
9. Schedule Updating: Update and resubmit the Schedule of Values prior to the next Application for Payment when Change Orders result in a change in the Contract Sum.
10. Cash Flow Projections: Contractor shall provide Cash Flow Projections at the Initial Application for Payment and at each subsequent Application for Payment in a form acceptable to the Owner including in tabular and graphic form. Include construction costs and soft cost projections (provided by the Owner).

1.03 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Owner's Project Manager and paid for by the Owner.
 1. The initial Application for Payment, the Application for Payment at time of Substantial Completion and the final Application for Payment involve additional requirements.
- B. Payment-Application Times: Each progress-payment date is indicated in the Agreement. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment-Application Forms: Use AIA Document G702 and Continuation Sheets G703 as the form of Applications for Payment.
- D. Application Preparation: Complete every entry on the form. Include notarization and execution of person authorized to sign legal documents on behalf of the Contractor. The Owner's Project Manager will reject incomplete applications without action.
 1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Update schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued prior to the of the construction period covered by the application.
- E. Transmittal: Submit 5 signed and notarized original copies of each Application for Payment to the Owner's Project Manager by a method ensuring receipt within 24 hours. One copy shall be complete, including waivers of lien and similar attachments, when required.
 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Owner's Project Manager.

F. **Waivers of Mechanics Lien:** With each Application for Payment, submit waivers of mechanics lien from every entity who is lawfully entitled to file a mechanics lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. The Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. **Waiver Delays:** Submit each Application for Payment with the Contractor's waiver of mechanics lien for the period of construction covered by the application.
 - a. Submit final Applications for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
5. **Waiver Forms:** Submit waivers of lien on forms, and executed in a manner, acceptable to the Owner.

G. **Initial Application for Payment:** Administrative actions and submittals, that must precede or coincide with submittal of the first Application for Payment, include the following prerequisites to processing

1. List of subcontractors, approved.
2. List of principal suppliers and fabricators, approved.
3. Schedule of Values including Cash Flow projections, approved.
4. Contractor's Construction Schedule, approved.
5. Schedule of unit prices, approved.
6. Submittal Schedule, approved.
7. List of Contractor's staff assignments.
8. List of Contractor's principal consultants.
9. Copies of building permits.
10. Copies of authorizations and licenses from governing authorities for performance of the Work.
11. Initial progress report.
12. Certificates of insurance and insurance policies.
13. Performance and payment bonds.
14. Data needed to acquire the Owner's insurance.
15. Initial settlement survey and damage report, if required.
16. Certificates of Insurance.
17. Bonds.
18. Material Status Reports.
19. Notarized Progress Report Statement from the Contractor's project manager stating that the work is on schedule, and that Contractor will meet the Substantial Completion date for the Work, and the Substantial Completion dates for every portion thereof as established under Construction Phasing Schedule Section
20. Safety plan
21. Construction progress photographs and video tapes.

H. **Monthly Application for Payment** Administrative actions and submittals, that must precede or coincide with submittal of the periodic Application for Payment, include the following.

1. **Waivers of Liens.**
2. As-built Record documents, required documents and submittal records on site.
3. Contractor's construction schedule, updated, with corrective action plan as applicable including 30 day look ahead schedule.
4. Material Status Report.
5. Stored Materials forms.
6. Submittal Schedule and submittal status reports.
7. Monthly Progress report, and Notarized Progress Report Statement from the Contractor's

manager stating that the work is on schedule, and that Contractor will meet the Substantial Completion date for the Work, and the Substantial Completion dates for every portion established under Construction Phasing Schedule Section.

8. Construction progress photographs and video tapes.
9. Change Order Log, including potential change orders.
10. Schedule of Values, including Cash Flow Projections
11. Safety Performance Update
12. Quality control Update
13. Environmental compliance Summary
14. Summary of commissioning activities
15. Proof of Payment for Police and Fire Watch Details

I. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.

1. This application shall reflect Certificates of Partial Substantial Completion issued previous to Owner occupancy of designated portions of the Work.
2. Administrative actions and submittals that shall precede or coincide with this application include:
 - a. Occupancy permits and similar approvals.
 - b. Warranties (guarantees) and maintenance agreements.
 - c. Approved Test/adjust/balance records.
 - d. Maintenance instructions.
 - e. Meter readings.
 - f. Startup performance reports.
 - g. Changeover information related to Owner's occupancy, use, operation, and main
 - h. Final cleaning.
 - i. Application for reduction of retainage and consent of surety.
 - j. Advice on shifting insurance coverages.
 - k. Final progress photographs.
 - l. List of incomplete Work, recognized as exceptions to Owner's Project Manager's Certificate of Substantial Completion.
 - m. Waivers of liens.

J. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following

1. Completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion.
3. Ensure that unsettled claims will be settled.
4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
5. Transmittal of required Project construction records to the Owner.
6. Certified property survey.
7. Proof that taxes, fees, and similar obligations were paid.
8. Removal of temporary facilities and services.
9. Removal of surplus materials, rubbish, and similar elements.
10. Change of door locks to Owner's access.
11. Consent of Surety to final payment

1.04 WAGE RATE REPORTING

A. Contractor and all sub-contractors shall submit to the Owner wage rate information on a weekly basis for each worker engaged on the Project demonstrating compliance with the State wage rate requirements.

1. At the beginning of each workers' employment, submit a worker information sheet stating the worker's full name, worker ID (last 4 digits of social security number), race/ ethnicity, male/ female, work classification, and eligibility to work including a criminal record check and their compliance with the OSHA approved safety and health training requirement.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including General, Bidding Documents, Contract Forms and Conditions of the Contract, and Division 01 – General Requirements, apply to the work of this Section.
- B. This section applies to all work performed under the Contract and is inherently made a part of each specification section.
- C. Related Work Specified Elsewhere:
 - 1. Section 01 26 13 – Requests For Interpretation
 - 2. Section 01 33 00 – Submittal Procedures
 - 3. Section 01 77 00 – Closeout Procedures

1.02 SUMMARY

- A. Section Includes:
 - 1. Project coordination
 - 2. Coordination drawings
 - 3. Project meetings

1.03 PROJECT COORDINATION

- A. Submittals, RFIs, Reports, Schedules, Meeting Minutes, and other project documents shall be issued and tracked by means of a commercially available online Project Management software at no additional cost to Owner.
 - 1. Project Management software: Procore Construction Software, Primavera Submittal Exchange, Autodesk Plangrid, or similar.
 - 2. Project Management software shall automatically distribute submittals and submittal reviews to Owner, Owner's Project Manager, and others deemed necessary.
- B. Coordinate scheduling, submittals, and work of various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements.
- C. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service such equipment.
- D. Coordinate space requirements and installation of mechanical and electrical items that are indicated diagrammatically on Drawings.
 - 1. Follow routing shown as closely as practical; place runs parallel with building lines.
 - 2. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and cleanup of work of separate Sections in preparation for Substantial Completion.

- G. After Owner occupancy, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents to minimize disruption of Owner's activities.

1.04 COORDINATION DRAWINGS

- A. Coordination Drawings:
 - 1. Prior to commencement of Work, prepare coordination drawings to define relationship of mechanical, plumbing, fire protection, and electrical components with beams, columns, ceilings and walls.
 - 2. Include plans, elevations, sections, and details required to define relationships between components.
 - 3. Prepare drawings at 1/4 inch = 1'-0" scale for general layout and 1/2 inch = 1'-0" for plans and sections in congested areas including equipment spaces.
 - 4. Submit electronically in Adobe PDF format.
- B. Hold coordination meetings with trades providing mechanical, plumbing, fire protection, and electrical work.
- C. Resolve conflicts between trades, prepare composite coordination drawings and obtain signatures on original composite coordination Drawings.
- D. When conflicts cannot be resolved:
 - 1. Cease work in areas of conflict and request clarification prior to proceeding.
 - 2. Prepare drawings to define and to indicate proposed solution.
 - 3. Submit drawings for approval when actual measurements and analysis of Drawings and Project Manual indicate that various systems cannot be installed without significant deviation from intent of Contract Documents.
- E. Submit original composite coordination drawings as part of Project Record Documents specified in Section 01 77 00 – Closeout Procedures.

1.05 PROJECT MEETINGS

- A. The Owner's Project Manager shall schedule and administer Preconstruction Conference and Progress Meetings.
- B. The Owner's Project Manager shall record significant proceedings and decisions at each meeting; reproduce and distribute copies to parties in attendance and others affected by proceedings and decisions made.

1.06 PRECONSTRUCTION CONFERENCE

- A. Preconstruction Conference shall be held within 15 days after date of Notice to Proceed on site, or at a central site convenient to all parties.
- B. Attendance:
 - 1. Contractor
 - 2. Major subcontractors
 - 3. Owner
 - 4. Owner's Project Manager
- C. Review and discuss:
 - 1. Relation and coordination of various parties, and responsible personnel for each party.

2. Use of premises, including office and storage areas, temporary controls, and security procedures.
3. Construction schedule and critical work sequencing.
4. Processing of:
 - a. Contract modifications
 - b. Shop Drawings, Product Data, and Samples
 - c. Applications for Payment
 - d. Substitutions
 - e. Requests for Interpretation
 - f. Other required submittals
5. Adequacy of distribution of Contract Documents.
6. Procedures for maintaining contract closeout submittals.
7. Installation and removal of temporary facilities.
8. Notification procedures and extent of testing and inspection services.

1.07 PROGRESS MEETINGS

- A. Progress Meetings shall be held weekly throughout construction.
- B. Location: Project field office
- C. Attendance:
 1. Contractor
 - a. Subcontractors as appropriate to agenda
 2. Owner
 3. Owner's Project Manager
 - a. Consultants as appropriate to agenda
 4. Others as appropriate to agenda.
- D. Review and Discuss:
 1. Work progress since previous meeting, including:
 - a. Field observations, deficiencies, conflicts, and problems.
 - b. Progress and completion date.
 - c. Corrective measures needed to maintain quality standards, progress, and completion date.
 2. Status of:
 - a. Requests For Interpretation
 - b. Submittals
 - c. Contract modifications
 3. Coordination between various elements of work.
 4. Maintenance of Project Record Documents.

1.08 PRE-INSTALLATION CONFERENCES

- A. Where required in individual specification Section, convene a pre-installation conference at project site or other designated location.
- B. Require attendance of parties directly affecting or affected by work of the specific Section.
- C. Review conditions of installation, preparation and installation procedures, and coordination with related work.

1.09 PROJECT PROCEDURES

- A. Work Hours: Comply with local ordinances and avoid creating a nuisance.
 1. Contractor will be allowed to start work at 7:00 AM and will be allowed to work until 5:00 PM, Monday through Friday.

- B. Layout: Employ an experienced, competent person to lay out the work. Establish and be responsible for all measurements and other work executed under the Contract.
- C. Discrepancies: If there are any discrepancies between the Contract Document and the actual conditions, notify the Owner's Project Manager/Engineer and Owner immediately in writing describing the discrepancy. Do not proceed until the discrepancy is resolved to the satisfaction of the Owner.
- D. Lines and Levels: As the work progresses, establish the actual lines needed to accurately layout and construct the work for all trades.
- E. Project Limit Line: The boundaries of the site do not limit the responsibility of the Contractor to perform the work in its entirety. Make utility connections as required.
- F. Observation: Notify the Owner and the authorities having jurisdiction at least thirty-six hours in advance of concealing any work. Comply with requirements of authorities having jurisdiction.
- G. Owner Occupancy and Owner Furnished and Installed Items: Cooperate and permit the Owner to install its materials, furnishings, fixtures, and equipment during the progress of the work in accordance with a mutually agreeable schedule before completion of the work in the Contract.
- H. Owner's Right to Occupy: The Owner may take possession of and use any completed or partially completed portion of the work in accordance with the provisions and requirements of the Conditions of the Contract.
- I. Owner's possession Does Not Mean Acceptance: Owner's possession, occupancy, or installation of material, furnishings, fixtures or equipment does not signify Owner's Acceptance of any portion of the work not completed in accordance with the Contract Documents.
- J. Owner's Responsibilities: The Owner will pay maintenance costs on the areas occupied by the Owner and will be responsible for wear and tear and damage caused by the Owner. The Owner will pay costs of heat, light, water, and other utilities used by the owner during its occupancy.
- K. Maintain safe and proper-working conditions at all times. Frequency of waste removal shall be as approved by the Owner and Authorities having jurisdiction.
- L. Dust Control: Refer to Section 01 74 00 – Dust Control. Make effective efforts to control dust. Wet travel areas, debris stockpiles, and other work as needed to control dust; do not create hazards in cold weather. Cover stockpiles and debris removal vehicles with tarpaulins.
- M. Installer's Acceptance of Conditions: Installers shall inspect previous work, substrates, related work, and conditions under which work is to be executed and shall report in writing to the Contractor all deficiencies and conditions detrimental to the proper execution and completion of the work.
- N. Noise Pollution: Strictly comply with noise pollution and control regulations and requirements of authorities having jurisdiction. Use properly muffled equipment. Use rubber tired equipment instead of metal track equipment to the greatest extent possible. Abide by local ordinances regarding work hours and limitations of noise.
- O. Labor Conditions: Employ throughout the work only such labor and other workers as will perform their duties and execute the work in the manner to avoid jurisdiction disputes,

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strikes, and delays resulting there from. Use in the prosecution of the work only such materials, equipment, and appliances that are produced, applied, and installed without involvement in labor jurisdictional disputes, strikes, and delays resulting therefore. Take all necessary actions to ensure labor harmony on the project; comply with applicable labor regulations. No additional payment shall be due for doing work under this provision or for delays or damages for failure to observe such requirements.

- P. Traffic Control and Parking: Limit site traffic to one access/egress point approved by the Owner and authorities having jurisdiction to the greatest extent possible. Control traffic to minimize damage to surrounding areas and danger to the public; provide flagmen as needed. Control parking on the site and cooperate with local authorities; do not obstruct streets, public ways and sidewalks. Comply with local ordinances and requirements of authorities having jurisdiction.
- Q. Advertisement: Whenever the Project is permitted to be published or advertised, the Owner's Project Manager's name shall be clearly stated.
- R. Superintendent: The Contractor shall employ an experienced Superintendent who shall possess the required license(s) for the specific trade(s), who shall be subject to the Owner's approval and who shall be present at the site during all work. The approved Superintendent shall not be reassigned or replaced during the entire duration of the Project without the Owner's written approval.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION – 01 31 00

SECTION 01 31 13

PROJECT COORDINATION

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies supervisory and administrative requirements for coordination of Work, including, but not limited to:

1. Coordination of work of employees and subcontractors.
2. Coordination with local agencies and utilities.
3. Coordination drawings.
4. Expedition of work to assure compliance with schedules.
5. Coordination of Work with that of other contractors and work by Owner.
6. Compliance with orders and instructions of Owner's Project Manager or Owner.

1.02 RELATED REQUIREMENTS

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. GENERAL CONDITIONS and Document 00 7300, MODIFICATIONS TO GENERAL CONDITIONS; Authority and Responsibilities of the Contractor.
2. Section 01 73 29, CUTTING AND PATCHING.
3. Section 01 31 19, PROJECT MEETINGS.
4. Section 01 33 00, SUBMITTAL PROCEDURES.
5. Section 01 50 00, TEMPORARY FACILITIES AND CONTROLS.
6. Section 01 91 13, CLOSEOUT PROCEDURES.

1.03 COORDINATION BY CONTRACTOR

A. Coordinate the Work of the Contract, including mechanical and electrical work, and other subcontractors. Anticipate areas where the installation of mechanical and electrical work will be restricted, congested, or difficult. Consult various affected subcontractors.

B. The General Contractor shall be responsible for the coordination of all mechanical and electrical work. He shall be responsible to anticipate areas where the installation of mechanical and electrical work will be restricted, congested or difficult for other reasons, consulting the various affected subcontractors, and shall submit to the Owner's Project Manager Coordination Drawings of these areas as specified under Article 1.05 below. Failure to anticipate "problem" areas and to submit coordination drawings of same shall be construed as acceptance of the conditions, and all necessary re-working and/or relocation of the installed mechanical and electrical elements resulting from failure to provide sufficient spaces, clearances, etc., shall be provided without additional cost to Owner.

C. Coordination Drawings are for the General Contractor's and the various Subcontractors use during construction and shall not be construed as replacing any Shop Drawings or Record Drawings required elsewhere in the Contract Drawings. Owner's Project Manager's review of any submitted Coordination Drawings shall not relieve General Contractor from his overall responsibility for the coordination of all work of the Contract.

1.04 COORDINATION WITH LOCAL AGENCIES

A. Contractor shall provide the Owner's Project Manager and the Town fire chief with sufficient advance notice of all inspections of the work by state Public Safety Department inspectors to enable a representative of the fire department to accompany such inspectors.

B. Contractor shall notify the Owner's Project Manager and appropriate Town officials in advance if there is ever a need to transport any hazardous waste or materials encountered during construction.

C. Construction conditions and liability considerations permitting, the Contractor shall provide a reasonable schedule of tours of the construction site to residents or officials of the Town.

1.05 COORDINATION DRAWINGS

A. General: Submit coordination drawings for areas where close and careful coordination of trades is required. The Contractor shall be fully responsible for coordinating trades, coordinating construction sequence and schedules, and coordinating actual installed location and interface of work. Coordination Drawings to include, but are not necessarily limited to:

1. Structure.
2. All equipment, including items in the Contract as well as OFCI and OFI items.
3. Existing conditions

B. Timing: Prior to fabricating materials or beginning work, supervise and direct the creation of one complete set of Coordination Drawings showing complete coordination and integration of work, including, but not limited to, structural, Owner's Project Manager, mechanical, plumbing, fire protection, elevators, and electrical disciplines.

C. Intent: Coordination Drawings are for the Contractor's use during construction and are not to be construed as replacing Shop Drawings or Record Drawings. Owner's Project Manager's review of submitted Coordination Drawings shall not relieve Contractor from his overall responsibility for the coordination of work of the Contract.

D. Base Sheets: Owner's Project Manager will provide CAD / Revit files for use by the Contractor for the development of building coordination drawing "base sheets" upon signed receipt of Owner's Project Manager's disclaimer form. General Contractor shall be responsible to prepare and provide one accurately scaled set of building coordination drawing "base sheets" on reproducible transparencies, showing all Owner's Project Manager and structural work. Base sheets shall be at an appropriate scale; congested areas and sections through vertical shafts shall be at a larger scale.

1. Highlight all fire rated and smoke partitions.
2. Indicate horizontal and vertical dimensions to avoid interference with structural framing, ceilings, partitions, and other services.
3. Indicate elevations relative to finish floor for bottom of ductwork and piping and conduit (6 inches and greater in diameter).
4. Indicate the main paths for the installation, or removal of, equipment from mechanical and electrical rooms.

E. HVAC: Contractor shall circulate Coordination Drawing base sheets to HVAC subcontractor and require HVAC subcontractor to accurately and neatly show actual size and location of HVAC equipment and work. HVAC subcontractor shall note apparent conflicts, suggest alternate solutions, and return Coordination Drawings to Contractor.

F. Plumbing: Contractor shall circulate Coordination Drawings to plumbing subcontractor and require plumbing subcontractor to accurately and neatly show actual size and location of all plumbing equipment and work. Plumbing subcontractor shall note apparent conflicts, suggest alternate solutions, and return the Coordination Drawings to the Contractor.

G. Electrical: Contractor shall circulate Coordination Drawings to electrical subcontractor and require electrical subcontractor to accurately and neatly show actual size and location of electrical equipment and work. Electrical subcontractor shall note apparent conflicts, suggest alternate solutions, and return Coordination Drawings to Contractor.

- H. Fire Protection: Contractor shall circulate Coordination Drawings to fire protection subcontractor and require fire protection subcontractor to accurately and neatly show actual size and location of fire protection equipment and work. Fire protection subcontractor shall note any apparent conflicts, suggest alternate solutions, and return Coordination Drawings to the Contractor.
- I. Other Subcontractors: The Contractor shall circulate Coordination Drawings to other subcontractors whose work might conflict with other work. Require these subcontractors to accurately and neatly show actual size and location of their equipment and work. These subcontractors shall note apparent conflicts, suggest alternate solutions, and return Coordination Drawings to the Contractor.
- J. Contractor Review and Submission: Contractor shall carefully review, modify and approve Coordination Drawings in cooperation with subcontractors to assure conflicts are resolved before work in field is begun and to ensure location of work exposed to view is as indicated or as approved by Owner's Project Manager. Contractor shall stamp, sign, and submit Coordination Drawing originals to Owner's Project Manager for review and approval following specified procedures and policies for "Submittals". Do not commence work in these areas until Coordination Drawings have been received and reviewed by Owner's Project Manager.

1.06 EXISTING UTILITIES

- A. Contractor shall notify public and private utility companies as required by law in advance of construction so that existing utilities may be accurately located and identified by the appropriate agency or utility.
- B. Give advance notice to public and private utility companies as required by law, and provide proper disposition, subject to Owner's Project Manager approval of existing pipe lines, conduits, sewers, drains, poles, wiring, and other utilities that interfere with work, whether or not they are specifically indicated on Drawings. The Contractor shall immediately notify Owner's Project Manager and appropriate authorities when coming across an unknown utility line, and await decision as to how to dispose of same. When an existing utility line must be cut and plugged or capped, moved, or relocated, or has become damaged, Contractor shall notify Owner's Project Manager and utility company involved, and assure protection, support, or moving of utilities to adjust them to new work. Contractor shall be responsible for damage caused to existing, active utilities under work of this Contract, whether or not such utilities are indicated on Drawings, including resultant damages or injuries to persons or properties.
- C. Contractor shall comply with the requirements of the Commonwealth of Massachusetts Statute - Chapter 82, Section 40, for excavations in public and private property. Compliance shall include the following:
 1. The Contractor shall notify public utility companies writing at least 72 hours (excluding Saturdays, Sundays, and legal holidays) but not more than 30 days before excavation of areas where underground utility plant (pipes, cables, manholes, etc.) exist.
 2. The Contractor shall be responsible for providing the Utility Companies with a schedule of his activities in areas where utilities exist.
 3. The Contractor shall immediately notify utility companies of any damage to their utilities resulting from construction operations.
- D. The Contractor shall notify DIGSAFE at 1-800-322-4844 at least 72 hours before digging, trenching, blasting, demolishing, boring, backfilling, grading, landscaping or other earth moving operations of any public ways, rights of way and easements.
- E. National Grid Requirements: National Grid has specific requirements for trenching and backfilling provided by other(s) than National Grid, in a private development or private land.
 1. No trenching shall be started until an on-site meeting has been held between the excavating contractor and National Grid personnel. Prior to the meeting, the excavating

contractor must notify Dig Safe of the proposed work. The following shall be resolved at the meeting:

- a. Whether the excavating contractor must supply sand to pad the trench bottom and cover the pipe. If required, the trench must be padded with 6" of sand and then covered with sand sufficient to provide six (6) inches of cover above pipe.
- b. The route of the trench.
- c. Minimum footage of the trench to be opened before National Grid shall move in crews to start installing the gas pipe.
- d. Minimum notice required for National Grid to start installing pipe.

2. Prior to scheduling crews, the excavating contractor shall inform National Grid of the Dig Safe number and notification and National Grid Distribution personnel shall inspect and approve the trench.
3. Once National Grid has installed the gas pipe, the Contractor shall be responsible for maintaining surface (valve) boxes, mains and services and shall be billed for additional work on same by National Grid.
4. If this work is to take place outside of the normal construction season (mid-March-November), off-site tie-ins on the city streets shall be done subject to National Grid crew availability, Engineering Department approval, and the issuance of required permits.

F. All plumbing, heating and electrical work, installation of equipment, and other similar work shall be carried out in such a manner as to avoid any interference with maintaining building systems operation. Where piping connections or other work specified in the Contract necessitate an interruption of any service, the General Contractor shall first make the necessary arrangement for each interruption of service with the Owner, and shall notify the Owner's Representative at least forty-eight hours in advance of his intent to connect, disconnect, turn on, or turn off, any utility services of the Owner's systems. It is expected that such interruptions will occur only during periods of low loads and the General Contractor shall include in his proposal all costs including premium time for such work.

G. Modifications or extensions of the Owner's existing utility service systems, if called for, will be done under the direct observation of the Owner's Representative. All tests in connection with this work shall be witnessed by authorized personnel of the General Contractor and the Owner's Representative.

1.07 CUTTING AND PATCHING

- A. The General Contractor shall do, or assign to the appropriate trade, all cutting, fitting, or patching as specified in Section 01 7300, EXECUTION. Certain portions of this work, such as cutting, coring, drilling, etc., may be specified to be provided under various trade Sections of the Specifications.
- B. The General Contractor shall provide all sheeting, shoring, bracing, underpinning, reinforcement and other temporary supports as may be required to maintain the integrity of, and prevent damage to, any structure or finish to be subjected to cutting work, and shall patch to restore to sufficient final strength, and acceptable appearance, subject to Owner's Project Manager's approval.

END OF SECTION

01 31 19
PROJECT MEETINGS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies administrative and procedural requirements for Project Meetings, including but not limited to:
 1. Pre-Construction Meeting.
 2. Pre-Installation Conference.
 3. Progress Meetings.
 4. Coordination Meetings.
 5. Special Meetings.
- B. Representatives of contractors, subcontractors, and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
- C. Owner's Project Manager and Owner will attend meetings to ascertain that Work is expedited consistent with Contract Documents and Construction Schedules.

1.02 RELATED REQUIREMENTS

- A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:
 1. Section 01 33 00, SUBMITTAL PROCEDURES.
 2. Section 01 77 00, CLOSEOUT PROCEDURES.

1.03 PROJECT MEETINGS, GENERAL

- A. Agendas: Contractor shall prepare agendas for Project Meetings. Distribute copies to parties in attendance.
- B. Meeting Notices: Contractor shall prepare and distribute written notices of Project Meetings four working days in advance of each meeting.
- C. Arrangements: Contractor shall make physical and/or virtual arrangements for Project Meetings, including but not limited to:
 1. Arranging space and seating.
 2. Ordering refreshments, lunches, etc.
- D. Owner's Project Manager shall preside at Project Meetings.
- E. Minutes: Contractor shall record minutes of Project Meetings, including significant procedures and decisions.
- F. Distribution of Minutes: Contractor shall reproduce and distribute copies of Project Meeting minutes after each meeting to participants of meeting, and to parties affected by decisions made at meetings within seven (7) calendar days following the meeting.

1.04 PRE-CONSTRUCTION MEETING

- A. Schedule within 15 days after date of Notice to Proceed.
- B. Location: A central site, convenient for all parties, designated by the Owner.

- C. Attendance: Require and notify the following to attend:
 - 1. Owner's Representative.
 - 2. Owner's Project Manager and his Professional Consultants.
 - 3. Resident Project Representative.
 - 4. Contractor's Superintendent.
 - 5. Major Subcontractors.
 - 6. Major suppliers.
 - 7. Others as directed by the Owner's Project Manager.
- D. Suggested Agenda:
 - 1. Discussion of major subcontractors and suppliers.
 - 2. Projected Construction Progress Schedules.
 - 3. Critical work sequencing.
 - 4. Major equipment deliveries and priorities.
 - 5. Project Coordination, including designation of responsible personnel.
 - 6. Procedures and processing of:
 - a. Field decisions.
 - b. Proposal Requests.
 - c. Submittals.
 - d. Change Orders.
 - e. Application for Payment.
 - 7. Adequacy of distribution of Contract Documents.
 - 8. Procedures for maintaining Record Documents.
 - 9. Use of premises:
 - a. Office, work, and storage areas.
 - b. Owner's requirements.
 - 10. Construction facilities, controls, and construction aids.
 - 11. Temporary utilities.
 - 12. Safety and first-aid procedures.
 - 13. Security procedures.
 - 14. Housekeeping procedures.

1.05 PRE-INSTALLATION CONFERENCES

- A. Conduct pre-installation conferences at site prior to construction activities which require coordination. Installers, manufacturer's representatives, and fabricators of materials or systems affected shall be required to attend. Advise Owner's Project Manager of scheduled meeting dates.
- B. Do not allow affected work to proceed if the conference cannot be successfully concluded. Initiate actions necessary to resolve impediments to performance of the work and reconvene the conference at the earliest feasible date.

1.06 PROGRESS MEETINGS

- A. Schedule regular weekly meetings, at regularly scheduled day and time.
- B. Hold called meetings as required by progress of the Work.
- C. Location of the meetings: Project field office of Contractor or as mutually agreed to if virtual attendance is permitted.
- D. Attendance: Require and notify the following to attend:
 - 1. Owner's Representative, Owner's Project Manager, and his professional consultants as needed.
 - 2. Subcontractors, as appropriate to the agenda.
 - 3. Suppliers, as appropriate to the agenda.

E. Suggested Agenda:

1. Review and approval of minutes of previous meeting.
2. Review of Work progress since previous meeting.
3. Field observations, problems, conflicts.
4. Problems which impede Construction Progress Schedule.
5. Review of off-site fabrication, and delivery schedules.
6. Corrective measures and procedures to regain projected schedule.
7. Revisions to Construction Progress Schedule.
8. Progress schedule during succeeding work period.
9. Coordination of schedules.
10. Review submittal schedules; expedite as required.
11. Maintenance of quality standards.
12. Pending changes and substitutions.
13. Outstanding RFI's.
14. Review proposed changes for:
 - a. Effect on Construction Progress Schedule and on completion date.
 - b. Effect on other contracts of the Project.
15. Other business.

1.07 COORDINATION MEETINGS

A. Conduct Coordination Meetings as necessary to properly coordinate the trades. Require representation of parties involved in coordination or planning of activities involved.

1.08 SPECIAL MEETINGS

A. Conduct Special Meetings as required throughout the course of the Work. Special meeting issues may include, but are not limited to:

1. Safety issues.
2. Labor issues.
3. Special schedule issues.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION – 01 31 19

SECTION 01 32 16

CPM SCHEDULE

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for the critical path method (CPM) of scheduling and reporting progress of the Work.

1. Refer to the General Conditions and the Agreement for definitions and specific dates of Contract Time.

B. Requirements Included:

1. General.
2. Description.
3. Computer Scheduling System.
4. Qualifications of Personnel.
5. Preparation Guidelines for CPM Schedules.
6. Submittal and Review Process.
7. Maintenance and Update of the CPM Schedule.
8. Project Schedule Revisions.
9. CPM Schedule Recovery.
10. Time Impact Analysis for Changes, Delays and Contractor Requests.
11. Payment.

1.02 RELATED REQUIREMENTS

A. Examine Contract Documents for requirements that affect Work of this Section. Other Specification Sections that directly relate to Work of this Section include, but are not limited to:

1. Section 01 31 19, PROJECT MEETINGS; Requirements for submitting and distributing meeting and conference minutes.
2. Section 01 33 00, SUBMITTAL PROCEDURES; Requirements for submitting the Preliminary Construction Schedule; requirements for submitting the Submittal Schedule.
3. Section 01 45 29, TESTING LABORATORY SERVICES; Requirements for submitting inspection and test reports.
4. Section 01 50 00, TEMPORARY FACILITIES AND CONTROLS; Requirements for submitting the list of products.

1.03 GENERAL

A. The Contractor's attention is specifically directed to the fact that submission and acceptance of the CPM Schedule as well as CPM Schedule progress updates are required for the Owner to certify the approximate amount of Work performed by the Contractor.

B. Neither the review nor acceptance of the Contractor's CPM Schedule or other data submitted by the Contractor pursuant to this Section, nor any other action on the part of the Owner under this section shall in any way be deemed as a representation by the Owner that the Contractor can or will be permitted to follow a particular schedule or sequence of operations or that, by following any such schedule or sequence, he can or will complete the Work by the time(s) required by the Contract or by any other time(s). Nor shall the acceptance of any CPM Schedule or other such data relieve the Contractor of his obligation to complete the Work by the time(s) required in the Contract, even though such CPM Schedule approved may be inconsistent with such completion.

C. Any acceptance under this Section shall be construed merely to mean that the Owner knew of no good reason at that time to object thereto. No review or acceptance or any other action

under this Section shall limit, affect or impair the Contractor's obligation to perform all the Work by time(s) required by the Contract and in accordance with all other provisions of the contract.

- D. The performance of the Work by the time(s) required in the Contract after taking into account extensions to which the Contractor may be entitled under the Article 1.10 herein - "Time Impact Analysis for Changes, Delays and Contractor Requests", may require the use by the Contractor of overtime labor, additional shifts or additional plant and equipment and/or other measures. In any event, the Contractor shall anticipate, avoid and mitigate the effects of all delays, whether or not such delays involve Activities with positive float. The Owner shall have the right at any time when in its judgment the Work is not proceeding in accordance with the CPM Schedule or at any time when it is likely that the Work might not be completed by the time(s) required in the Contract, to order the Contractor without additional compensation, to employ additional shifts, to increase the number of men employed, to use additional plant or equipment, or to take such steps as may be necessary or required to assure the completion of the various operations within the time(s) allotted therefore in the approved CPM Schedule or by the aforesaid completion time(s).
- E. No action on the part of the Contractor pursuant to this Section shall be construed as a request for an extension of the time(s) for completion required by the Contract. A request for an extension of time shall be deemed made only if it complies with the requirements of Division 1 of these specifications. No extension of the time(s) for completion shall be inferred because of any action, failure to act, or statement on behalf of the Owner pursuant to this Section.

1.04 DESCRIPTION

- A. The Contractor shall at his own expense prepare, maintain and update detailed Critical Path Method (CPM) Resource-Loaded Progress Schedules (hereinafter "CPM Schedule") as described in this Section. CPM Schedules shall be prepared in such a manner as to permit the orderly planning, organization, execution of the work, and be sufficiently detailed to accurately depict all the Work required by the Contract. The CPM Schedules shall be updated and revised if necessary, no less than once a month during the course of the Work and shall accurately reflect and report the actual performance and progress of the Work.

1.05 COMPUTER SCHEDULING SYSTEM

- A. The Contractor shall utilize a computer scheduling system that is capable of complying with the resource requirements of these specifications and designed specifically for the production of CPM schedule computer reports which will validate the detailed logic networks and provide the required schedule analysis and supporting documentation for progress payments.

1.06 QUALIFICATIONS OF PERSONNEL

- A. The Contractor will engage, at the Contractor's own expense, a qualified CPM Scheduling Consultant (hereinafter "Scheduling Consultant"), approved by the Owner, to assist in the preparation and production of the CPM Schedule. The Contractor may perform these services with the Contractor's own organization if the qualifications of assigned staff are approved by the Owner.

B. The Scheduling Consultant, or the Contractor's assigned staff, shall meet the following criteria:

1. Has at least one full time employee skilled in the application of computerized CPM network techniques to construction projects of the magnitude and complexity of this project.
2. Has available computer equipment and software for the production of the required CPM network and reports.

C. Prior to engaging a Scheduling Consultant or commencing the performance of the Work required under this Section with the Contractor's own staff, the Contractor shall submit to the Owner for acceptance:

1. The name and address of the proposed Scheduling Consultant, if used.
2. Information sufficient to show that the proposed Scheduling Consultant, or the Contractor's own organization, has staff and computer facilities meeting the criteria specified in this Section.
3. A list of prior projects for which the proposed Scheduling Consultant, the Scheduling Consultant's organization or the Contractor's staff has performed services similar to those required under this Contract.

1.07 PREPARATION GUIDELINES FOR CPM SCHEDULES

A. The CPM Schedule shall represent a practical plan to complete the Work within the required time(s) for completion, as defined in the Contract Documents.

1. A CPM Schedule showing completions later than those specified will not be accepted.
2. Schedules found to be impractical by the Owner, at its sole discretion, shall be revised and resubmitted by the Contractor.

B. The CPM Schedule shall show the sequence and interdependence of submittals, material procurement and construction activities and shall specifically include as a minimum:

1. The start and completion of all items of the Work, their major components and milestone completion dates, if any.
2. Submittals and material procurement activities including, but not limited to:
 - a. Shop Drawings, Catalog Cuts & Samples
 - b. Steps required to obtain necessary permits
 - c. Inspections/Surveys
 - d. Safety Plans
 - e. Temporary Facilities and Utilities
 - f. Project Record Documents
 - g. Operations & Maintenance Manuals

These activities in the CPM Schedule shall indicate the following:

 - 1) Time of submittals, review and acceptance by the Owner.
 - 2) Time of fabrication and delivery of manufactured products.
 - 3) The relationship between procurement and construction activities.
3. Activities for the preparation and submission of as-built documentation.
4. Activities relating to the start-up and testing of equipment and/or systems for completion of punch list items and training of personnel.
5. All the relationships to Work of other Contractors or to the operation of the Airport which affect the Work to be performed under this Contract.

C. The CPM Schedule shall:

1. Be sufficiently detailed to assure adequate planning, execution and progress evaluation of

the Work within Contract time(s) for completion. Activities shall generally range in duration from 3 to 15 working days or as deemed reasonable by the Owner, based on complexity and criticality of the tasks involved. An exception will be made for procurement items which may have a duration which starts with the approval of shop drawings and ends with delivery of the item to the construction site.

2. Allow for monitoring and evaluation of progress in performance of the Work.
3. If the CPM submittal shall be in the form of Precedence Diagramming Method (PDM), the only PDM activity dependency that shall be allowed is Finish to Start lag= 0.
 - a. No matter the method or form of the CPM, the activities shown shall include all of the following:
 - 1) Activity identifier - Maximum length of 8 characters.
 - 2) Concise description of the work.
 - 3) Duration in workdays.
 - 4) The dollar value of each activity in the schedule for cash flow purposes.
 - 5) Resources for each activity to include:
 - a) Average labor crew size estimated to install material.
 - b) Major equipment needed to support installation.
 - 6) Responsibility Code; identifying who performs the Work by trade.
 - 7) Other codes as designated by the Owner.
 - 8) Include milestone activities as designated by the Owner.
 - b. The network diagram shall show continuous flow from left to right.
4. Identify Work days per week and shifts per day that the Contractor intends to perform Work.
5. Include time for the Owner to review submittals or inspect the Work.
6. Identify activities constituting the controlling operations or Critical Path.

D. The CPM Schedule shall constitute the representation that:

1. The Contractor and Subcontractors plan to execute the Work in the sequence indicated.
2. The Contractor has distributed the CPM Schedule to his subcontractors for their review and comment. It shall be the Contractor's responsibility to obtain each Subcontractor's written approval and/or concurrence with the CPM Schedule. If a Subcontract has not been awarded for a certain portion of the Work when the Contract progress schedule is submitted, the Contractor will modify the CPM data to reflect any changes resulting from the new subcontractual arrangement through the procedure outlined herein, "PROJECT SCHEDULE REVISIONS".
3. All elements of Work required for the performance of the Contract shall be included. Failure by the Contractor to include any element of Work required for performance of the Contract shall not excuse the Contractor from completing all Work in accordance with specified milestones.
4. Seasonal weather conditions shall be considered and included in the planning and scheduling of all Work influenced by high and low ambient temperatures and/or precipitation to ensure completion of all Work in accordance will specified milestones. Seasonal weather conditions shall be determined by an assessment of average historic climatic conditions based upon the preceding 10 years records published for the National Oceanic and Atmospheric (NOAA) meteorological weather station located at Logan International Airport.
5. The Contractor has inspected the Project site and has considered the Work of other Contractors.
6. The Contractor has incorporated any other special conditions in planning the Work such as specified non-work periods, etc.

1.08 SUBMITTAL AND REVIEW PROCESS

A. Within 14 calendar days from Contractor's Notice to Proceed (NTP), the Contractor shall submit to the Owner for acceptance an interim CPM Schedule covering the first 90 calendar days after NTP. The schedule shall be loaded with resources.

- B. The CPM Schedule for the entire duration of the Project, with full resource loading, is due 30 calendar days after NTP. The Owner's Project Manager may withhold all or a portion of the progress payments until the Contractor submits a complete CPM Schedule acceptable to the Owner's Project Manager.
- C. For the CPM Schedule submittals and each of the Schedule Update submittals, the Contractor shall provide the following:
 - 1. Schedule Reports (three copies of each) - includes detailed activity information relating to early start, early finish, late start, late finish, total float, original duration, remaining duration, actual start, actual finish, percent completion, and resource usage.
 - a. Activity Report - all activities sorted by activity identifier.
 - b. Critical Path Report - activities with percent complete less than 100%, sorted by Total Float, then by Early Start.
 - c. Early Start Report - all activities sorted by Actual/Early Start.
 - 2. Cash Flow - all activities, using the Early Start schedule, by month.
 - 3. Graphic Displays one each of the Complete Project Schedule - including time display from the beginning to the completion of the Work
 - a. Network Diagram - all activities on a time scaled diagram displaying each activity number, description and Total Float.
 - b. Summary Bar Chart
 - 4. Computer Files - one copy of all CPM schedules in an electronic readable format capable of being read by Primavera Project Planner on diskette. Each Schedule Update, Schedule Revision or Time Impact Analysis must be an individual data file to allow Target data comparisons with other CPM submittals
- D. The Owner will review the Contractor's interim CPM Schedule and complete CPM Schedule and Schedule Update submittals and return them to the Contractor with comments or acceptance within 7 calendar days. If not accepted by the Owner, the Contractor shall revise Schedules in accordance with the Owner's comments, and resubmit for the Owner's acceptance, within 7 calendar days of the receipt by the Contractor of the Owner's comments. Until such time as the Owner grants acceptance, the Contractor shall resubmit these Schedules by the same time frames and in the same format as required in this paragraph for the initial resubmission.
- E. The Contractor shall certify that both the CPM Schedule and schedule update submittals correctly represent the sequence, means, methods, techniques and procedures in which he plans to execute the Work, and the actual execution of the Work.
- F. At the discretion of the Owner, the Contractor's applications for payment may either be withheld or modified due to the Contractor's failure to submit acceptable CPM Schedules within the stated number of calendar days from NTP and the acceptance thereof by the Owner.
- G. Format for Submittals: Submit required submittals in the following formats:
 - 1. PDF electronic file.
 - 2. Two paper copies.
- H. Startup construction schedule.
 - 1. Approval of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- I. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
 - 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 - 3. Total Float Report: List of all activities sorted in ascending order of total float.
 - 4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.

J. Updating Reports: Submit with Applications for Payment.

K. Qualification Data: For scheduling consultant.

1.09 MAINTENANCE AND UPDATE OF THE CPM SCHEDULE

A. The Contractor shall conduct a monthly progress meeting attended by representatives of the Contractor, the Owner and others as deemed necessary. The focus of the meeting is to assess Project status and develop solutions to items hindering progress. The attendees shall review:

1. Progress during the period.
2. Progress scheduled during the next period, as forecasted and as originally planned.
3. Anticipated problems and proposed solutions.
4. Discussion of each one of the logic revisions covering the impact on the schedule.
5. Analysis and discussion of alternative methods to mitigate accumulated delays.

B. At the monthly progress meetings, the Contractor shall submit to the Owner's Project Manager for review a detailed 6 week look ahead Bar Chart Progress Schedule from the current CPM Schedule.

C. The Contractor will prepare meeting notes summarizing schedule status, problems hindering progress and actions to be taken to maintain planned progress (action item list designating action, person responsible, and date action to be taken).

D. Within 5 days of the conclusion of the monthly progress meeting, the Contractor shall submit, based on the schedule status information discussed and accepted at the monthly progress meeting, an updated CPM schedule. Reported progress for each affected activity will include:

Actual Start Date

Actual Finish Date (for completed activities)

Remaining Duration (for activities in progress)

Percent Complete

Calculations for the updated schedule must be based on retained logic.

Each Schedule Update submission will include all materials as described herein.

E. As frequently as deemed necessary, the Owner's Project Manager may require, at no additional cost to the Owner, the Contractor to expand in further detail any part of the Schedule Update CPM Schedule in order to explain and demonstrate the construction sequence forecasted therein. This expanded Schedule shall be in sufficient detail and shall comply with the following requirements:

1. Be in CPM format
2. Identify the Work being performed
3. Be submitted within 15 calendar days from receipt of the Owner's request

In order to complement the information provided in these expanded/detail schedules the Contractor may also be requested to prepare and submit marked-up drawings such as cross sections, profiles and plan views of the area under analysis.

1.10 PROJECT SCHEDULE REVISIONS

A. Updating the CPM Schedule to reflect actual progress made to the date of a Schedule Update shall not be considered revisions to the CPM Schedule. All other changes, including but not limited to, the following shall be considered CPM Schedule Revisions:

1. Adding and/or deleting activity relationships.
2. Adding and/or deleting activities.
3. Changes to original durations.
4. Changes to Contract Milestone dates.

5. Performance of Work out of sequence.
- B. If, as a result of the monthly CPM Schedule Update, it appears the CPM Schedule no longer represents the actual prosecution and progress of the Work the Owner's Project Manager will request, and the Contractor shall submit, a revision to the CPM Schedule.
- C. Before any revisions are incorporated into the CPM Schedule, the Contractor shall present, and the Owner's Project Manager must accept, the revisions.

1.11 CPM SCHEDULE RECOVERY

- A. Whenever the Contractor fails to achieve a Milestone established in the Contract Schedule, or the Contractor's progress is not commensurate with that required to adhere to that Contract Time or Milestone(s), the Contractor shall promptly undertake appropriate action at no additional cost to the Owner to recover the CPM Schedule.
- B. The Contractor shall submit with the next Application for Payment (following recognition of the problem) a written recovery statement including a CPM recovery schedule to the Owner's Project Manager describing the cause for the slippage and the actions planned by the Contractor to recover the CPM Schedule within the shortest reasonable time.
- C. Appropriate recovery actions may include, but not be limited to, assignment of additional labor, subcontractors or equipment, shift or overtime work, expediting of submittal or deliveries, or any combination of them. Overlapping of activities or sequencing changes to increase Activity concurrence shall be deemed appropriate only if properly substantiated in the submittal.
- D. The Contractor's refusal, failure or neglect to take appropriate recovery action or to submit a written recovery statement shall constitute reasonable evidence that the Contractor is not prosecuting the Work, or separable part, with the diligence that will insure its completion within the applicable Contract Time and shall constitute sufficient basis for the Owner's Project Manager to recommend to withhold any payment otherwise due, or identify and order alternate recovery actions on the basis of the information in the Contract CPM Schedule.

1.12 TIME IMPACT ANALYSIS FOR CHANGES, DELAYS AND CONTRACTOR REQUESTS

- A. When changes are initiated or delays are experienced, or the Contractor desires to revise the CPM Schedule, the Contractor shall submit to the Owner's Project Manager a written Time Impact Analysis illustrating the influence of each change, delay, or Contractor request on any Milestone. Each Time Impact Analysis shall include Fragmentary Network (Network Analysis) demonstrating how the Contractor proposes to incorporate the change, delay or Contractor request into the CPM Schedule. The Time Impact Analysis shall demonstrate the time impact to each and every affected Activity in the CPM Schedule utilizing the most recent CPM Schedule Update as the basis for the Analysis. The date of the most recent CPM Schedule Update shall be a date prior to the date the change is given to the Contractor, the date the delay occurred or the date the Contractor submits a request for a change. The event time used in the Time Impact Analysis shall be included in the most recent CPM Schedule Update or as adjusted by mutual agreement. The Time Impact Analysis shall include a computer diskette which shall contain the details of the change including, but not limited to, added, changed or deleted data for Activities, logic restraints, resources or costs.
- B. Activity delays shall not necessarily mean that an extension of any Milestone is warranted or due the Contractor. A change or delay may not affect existing critical Activities or cause non-critical Activities to become critical. A change or delay may result in only absorbing a part of the available total float that may exist within an Activity chain of the Network, thereby not causing any effect on any Milestone.
- C. Total float is defined as the amount of time between the early start date and the late start date, or the early finish date and the late finish date, for each and every activity in the CPM Schedule. Float is not for the exclusive use or benefit of either the Owner or the Contractor.

- D. Four copies of each Time Impact Analysis shall be submitted within 10 calendar days after the commencement of a delay or the notice of direction for a change is given to the Contractor.
- E. In cases where the Contractor does not submit a Time Impact Analysis within 10 calendar days, the Contractor agrees that the particular change, delay or Contractor request does not require an extension of time to a Milestone and the Contractor hereby waives its right to subsequently request a time extension.
- F. Acceptance or rejection of each Time Impact Analysis by the Owner shall be made within 10 calendar days after receipt unless subsequent meetings and negotiations are necessary. Upon acceptance, a copy of the Time Impact Analysis signed by the Owner shall be returned to the Contractor, and incorporated into the CPM Schedule at the next monthly CPM Schedule Update. The Time Impact Analysis shall be incorporated into and attached to any relevant Change Order(s).

1.13 PAYMENT

- A. No separate payment will be made for Work under this section. The cost of Work described in this section shall be included in the Contract price.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 32 26

CONSTRUCTION PROGRESS REPORTING

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Daily construction reports including count of all personnel at project site.
2. Material location reports.
3. Site condition reports.
4. Special reports.
5. Affirmation of Purchase Orders.
6. Work documentation, periodic site observations.
7. Work documentation, construction progress photographs.

B. Related Requirements:

1. Section 01 31 19 PROJECT MEETINGS
2. Section 01 33 00 SUBMITTAL PROCEDURES for submitting reports.
3. Section 01 32 16 CPM SCHEDULE
4. Section 01 45 00 QUALITY CONTROL for submitting a schedule of tests and inspections.

1.02 INFORMATIONAL SUBMITTALS

- A. Daily Construction Reports: Submit at weekly intervals.
- B. Material Location Reports: Submit at monthly intervals.
- C. Site Condition Reports: Submit at time of discovery of differing conditions.
- D. Special Reports: Submit at time of unusual event.

PART 2 - PRODUCTS

2.01 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (see special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.

12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial completions and occupancies.
19. Substantial Completions authorized.

B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:

1. Material stored prior to previous report and remaining in storage.
2. Material stored prior to previous report and since removed from storage and installed.
3. Material stored following previous report and remaining in storage.

C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.02 SPECIAL REPORTS

- A. Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

2.03 AFFIRMATION OF PURCHASE ORDERS

- A. Several items specified in individual specification sections are products requiring (long lead time. To ensure smooth progress of the Project without unwarranted delays, and to confirm compliance with the Contract Documents, the Contractor shall furnish affirmation of purchase orders for those items indicated in the individual specification sections as being long lead items.
- B. Affirmation of purchase orders made by the Contractor or subcontractors shall be submitted to the Owner's Project Manager within 7 calendar days from date of Notice to Proceed, or Date of Agreement whichever is earlier.
- C. Affirmation shall include cover letter to Owner's Project Manager naming the purchased products, anticipated date of delivery, and referencing applicable specification section. Attach to letter, copy of Bill of Sale, or other term of receipt, indicating payment or down payment for each of the indicated products. Bill of Sale shall clearly show date of purchase, product identification, quantities ordered and amount paid.
 - I. In lieu of Bill of Sale. Contractor may obtain from vendor a notarized letter on the vendor's letterhead. Vendor's letter shall certify placement of order and identify date of purchases products and quantity purchased.

2.04 WORK DOCUMENTATION - PERIODIC SITE OBSERVATIONS

- A. Observe and maintain a record of tests. Record the following:
 1. Specification section number, product(s), and name of subcontractor or installer.
 2. Name of testing agency and name of Inspector.
 3. Name of manufacturer's representative present.
 4. Date, time and duration of tests.
 5. Type of test and results.
 6. Retesting required.
- B. Observe startup and adjustments; record time and date of equipment start-up and results.
- C. Observe equipment demonstrations to Owner; record times and additional information required for operation and maintenance manuals.
- D. Assist Owner's Project Manager/Engineer with final inspections. Prepare list of items to be completed and corrected.

2.5 WORK DOCUMENTATION - CONSTRUCTION PROGRESS PHOTOGRAPHS

- A. Furnish digital photographs of site and construction through-out the progress of Work, produced by an experienced photographer acceptable to Owner's Project Manager and Owner.
 - I. Submittals:
 - a. Discs: 2 copies. monthly and at final project completion.
- B. Views: Take photographs from differing directions indicating the relative progress of the Work. Take photographs monthly on date for Application of Payment. and at final completion.
 - 1. As a minimum each month during the Work, furnish the following number of views (as appropriate to Work being performed) and additional views as directed by the Clerk of the Works.
 - a. Views of site construction: 2
 - b. Exterior views of building: 2
 - 2. Take additional photographs for the following major portions of work:
 - a. Start and completion of site preparation.
 - b. Completion of excavations, prior to form work or footings.
 - c. Completion of demolition.
 - d. Completion of foundations.
 - e. Each stage of completion of structural framing.
- C. Discs: Identify each disc on the back with the following information:
 - 1. Project identification.
 - 2. Date and time of exposure, and orientation of views.
 - 3. Photographer's name, address, and phone number.
- D. Prints: If requested, shall be furnished at prevailing commercial rates.

PART 3 - EXECUTION (Not Used)

END OF SECTION

01 32 33
PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Construction photographs

1.02 PHOTOGRAPHY

- A. Provide photographs taken each month just prior to date for each scheduled Application for Payment.
- B. Photograph locations:
 - 1. Provide photographs as required to fully document construction.
 - 2. Photograph project from four (4) different views at each specified time; views as directed by Owner's Project Manager.
 - 3. At successive periods of photography, take photographs from same overall view as previously taken.
- C. Utilize digital technology at minimum 1216 x 912 capture resolution.
- D. Provide factual presentation.
- E. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

1.03 DIGITAL FILES

- A. Index digital files in chronological sequence.
- B. Identify each view by listing:
 - 1. Orientation of view
 - 2. Date taken
 - 3. Sequential photograph number

1.04 SUBMITTALS

- A. Submit each month's digital files along with each Application for Payment.
- B. Submit full set of digital files along with Project Record Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION – 01 32 33

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements for submittals required for performance of Work, including, but not limited to:

1. Construction progress schedules.
2. Schedule of values.
3. Submittal schedule.
4. Shop drawings.
5. Product data.
6. Samples.
7. Daily construction reports.
8. Construction photographs and video.

B. Administrative Submittals: Refer to requirements specified in other Division 1 Specification Sections, and other Contract Documents, for administrative submittals, including, but not limited to:

1. Permits.
2. Applications for payment.
3. Performance and payment bonds.
4. Insurance certificates.
5. List of subcontractors.

1.02 RELATED REQUIREMENTS

A. Examine Contract Documents for requirements that affect Work of this Section. Other Specification Sections that directly relate to Work of this Section include, but are not limited to:

1. Section 01 11 00, SUMMARY OF WORK.
2. Section 01 31 13, PROJECT COORDINATION; Coordination drawings.
3. Section 01 71 23, FIELD ENGINEERING; Survey and layout data submittals.
4. Section 01 45 29, TESTING LABORATORY SERVICES; Test reports.
5. Section 01 60 00, PRODUCT REQUIREMENTS; Manufacturer's instructions.
6. Section 01 60 00, PRODUCT REQUIREMENTS; Contractor's list of Products.
7. Section 01 73 00, CLOSEOUT PROCEDURES; Closeout submittals.

1.03 SUBMITTAL PROCEDURES

A. Coordination of Submittals: Coordinate preparation and processing of submittals with related construction activities. Transmit submittals sufficiently in advance of performance of Work to avoid delays. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related pertinent activities that require sequential activity.

1. Owner's Project Manager may reject, or withhold action on submittals requiring coordination with other submittals until related submittals are received.

B. Processing of Submittals: Allow sufficient review time to ensure installation will not be delayed because of time required to process submittals. Minimum processing times are as follows:

1. Review by Owner's Project Manager's Office Only: Allow ten business days for review and processing
2. Review by Owner's Project Manager and Consultant: Allow ten business days for review and processing of submittals by Owner's Project Manager, and an additional five business days for review by each consultant.
3. Reprocessing of Submittals: For submittals not approved initially, allow ten business days for review and reprocessing of submittals by Owner's Project Manager, and an additional five business days for review by each consultant.
4. No extension of Contract Time will be authorized due to failure to transmit submittals sufficiently in advance of scheduled performance of Work.
5. The contractor is responsible for all shop drawings, samples, product data (hereinafter "submittals") to be provided as thoroughly required in Contract Documents. If, in the opinion of the Owner's Project Manager these are not, or require more than two reviews by the Owner's Project Manager, the contractor shall be deemed in violation of progress and schedule and therefore subject to back charges.
6. If, in the opinion of the Owner's Project Manager these are not, or require more than two reviews by the Owner's Project Manager, the contractor shall be deemed in violation of progress and schedule and will be charged \$1,000.00 per additional review, and subject to additional back charges.

C. Contractor's Preparation of Submittals: Submit each submittal with the Owner's Project Manager's transmittal form, a copy of which is attached at the end of this Section. Place permanent label or title block on each submittal for identification. Indicate Project Name, Owner's Project Manager's Project Number, Specification Section number and title, date of submittal, name and address of Owner's Project Manager, name and Address of Contractor, name and address of subcontractor and/or supplier, name of manufacturer, Drawing number and detail reference.

1. Contractor's Review and Action Stamp: Provide suitable space on label or title block for Contractor's review and action stamp. Stamp and sign each submittal to show Contractor's review and approval prior to transmittal to Owner's Project Manager. Submittals not signed and stamped by Contractor will be returned without action.
2. Owner's Project Manager's Review and Action Stamp: Provide minimum 4 in. x 4 in. space on label or title block for Owner's Project Manager's review and action stamp. Deliver submittals to Owner's Project Manager at address listed on cover of Project Manual.
3. Modify and customize submittals as required to show interface with adjacent work and attachment to building.
4. By approving and submitting Shop Drawings, Product Data, Samples, and similar submittals the Contractor thereby represents that the Contractor has determined and verified all dimensions, quantities, field dimensions, relations to existing work, coordination with work to be installed later, coordination with information on previously accepted Shop Drawings, Product Data, Samples, or similar submittals and verification of compliance with all the requirements of the Contract Documents. The accuracy of all such information is the responsibility of the Contractor. In reviewing Shop Drawings, Product Data, Samples, and similar submittals the Owner's Project Manager shall be entitled to rely upon the Contractor's representation that such information is correct and accurate.

D. Transmittal of Submittals: Transmit each item with Owner's Project Manager's transmittal form, a copy of which is attached at the end of this Section. Identify Project, Contractor, subcontractor, major supplier; identify pertinent Drawing sheet and detail number, and Specification section number, as appropriate, on transmittal form.

1. Source: Submittals received from sources other than Contractor will be returned without action.
2. Deviations from Contract Documents: When products, materials, or systems submitted deviate from Contract Documents, record deviations clearly on transmittal form, or

separate attached sheet.

- E. Comply with progress schedule for submittals related to Work progress.
- F. After Owner's Project Manager reviews submittal, revise and resubmit as required. Identify changes made since previous submittal. Changes not marked will be treated as having not been made, even if change is consistent with Contract Documents.
- G. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report inability to comply with provisions.
- H. Substitutions: Refer to Section 01 60 00, PRODUCT REQUIREMENTS.

1.04 CONSTRUCTION PROGRESS SCHEDULES

- A. Prepare Construction Progress Schedules. Comply with requirements specified in Section 01 32 16 CPM SCHEDULE.

1.05 SUBMITTAL SCHEDULE

- A. Timing: Prepare and issue complete Submittal Schedule no later than ten (10) working days after Owner's Project Manager accepts Construction Progress Schedule.
- B. Preparation: Coordinate Submittal Schedule with Construction Progress Schedule, and Schedule of Values.
- C. Content of Submittal Schedule: Prepare schedule in order by Specification Section. Provide the following information for each submittal:
 1. Scheduled date of initial submittal.
 2. Specification Section number.
 3. Submittal type.
 4. Name of subcontractor or supplier.
- D. Distribution: Print and distribute Submittal Schedule to Owner's Project Manager, Owner, subcontractors, and other parties affected. Post copies in field office.
- E. Revisions: Update and reissue Submittal Schedule monthly in conjunction with Application for Payment.

1.06 SHOP DRAWINGS

- A. Provide accurately prepared, large scale and detailed shop drawings prepared specifically for this Project on reproducible sheets. Show adjacent conditions and related work. Show accurate field dimensions where appropriate. Identify materials and products shown. Note special coordination required. Standard information prepared without specific reference to Project is not considered shop drawings.
- B. Shop drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings.
- C. Show every component of fabricated item, notes regarding manufacturing process, coatings and finishes, identifying numbers conforming to Contract Documents (i.e. stair numbers, door numbers, etc.), dimensions, and appropriate trade names. Show anchorage and fastening details, including type, size and spacing. Show material gage and thickness. Indicate welding details and joint types.

- D. Shop Drawing Sheet Size: Except for templates, patterns, and other full-size drawings, submit shop drawings on sheets at least 8-1/2 in. x 11 in., but no larger than 30 in. x 42 in. Coordinate with Owner's Project Manager regarding electronic submittals
- E. Submittal Quantities: Submit shop drawings in following quantities:
 - 1. Architectural: For shop drawings submitted for Owner's Project Manager's review, submit one reproducible and one black line print of each sheet.
 - 2. Consultants: For shop drawings that require Consultant's review, submit one reproducible and two black line prints of each sheet.
 - 3. Clerk of Works: For all approved shop drawings, one blackline print of each submittal directly to the Clerk of Work's office.

1.07 PRODUCT DATA

- A. Definition: Product data includes manufacturer's standard published literature, such as installation instructions, catalog cuts, color charts, rough-in diagrams, and wiring diagrams. When product data must be prepared specifically because standard published data is not suitable for use, submit as shop drawing.
- B. Preparation: Mark each copy of product data to show applicable choices and options. Where published product data includes information on several products and choices, mark copies to clearly indicate information applicable to this Project.
- C. Do not submit product data until compliance with requirements of Contract Documents has been confirmed.
- D. Submittal Quantities: Submit product data in following quantities:
 - 1. Architectural Work: Submit number of copies required by Contractor, plus additional two copies to be retained by Owner's Project Manager.
 - 2. Consultant's Work: Submit number of copies required by Contractor, plus an additional three copies to be retained by Consultant, and an additional one copy to Owner's Project Manager. Forward copy of transmittal to Consultant. Consultant's review and comments will be made on copies returned to Owner's Project Manager, who will forward them to Contractor.
 - 3. Clerk of Works: For product data, submit one copy of each submittal directly to the Clerk of Work's office.
- E. Installer Copy: Verify that installer of Work possesses a current copy of Owner's Project Manager-approved product data prior to installation.

1.08 SAMPLES

- A. Submit samples identical with materials and products to be installed. Where indicated, prepare samples to match Owner's Project Manager's sample. Label sample with description, source, manufacturer's name, and catalog number. Submit samples along with certifications that products comply with referenced standards.
- B. Owner's Project Manager Review: Owner's Project Manager will review samples for confirmation of visual intent, color, pattern, texture, and type. Owner's Project Manager will not test samples for compliance with other specified requirements, which shall remain exclusive responsibility of Contractor.
- C. Submittal Quantities: When variation in color, pattern, or texture can be expected in finish work, submit multiple samples (minimum of three) to show approximate limits of variations. Submit samples in following quantities:

1. Initial Selection: For initial selection of color, texture, and pattern, submit one full set of manufacturer's available samples.
2. Verification Samples: Submit three sets of samples selected. One set will be returned to Contractor for use at Project Site for quality control comparisons.

D. Distribution: Distribute additional sets of approved samples to subcontractors, suppliers, installers, and others required for proper performance of Work. Indicate distribution on transmittal forms.

1.09 DAILY CONSTRUCTION REPORTS

- A. Prepare Daily Construction Reports. Comply with requirements specified in Section 01 32 26 CONSTRUCTION PROGRESS REPORTING.

1.10 SCHEDULE OF VALUES

- A. Timing: Submit Schedule of Values allocated to the various portions of the Work within ten (10) working days after award of Contract. Submit separate Schedule of Values for each different phase. Comply with requirements specified in Section 01 29 00 PAYMENT PROCEDURES.
- B. When requested by Owner's Project Manager, submit substantiating data supporting the values submitted.
- C. Intent: Unless objections are stated by Owner's Project Manager, the Schedule of Values will be used as the basis for the Contractor's Applications for Payment.
- D. Form and Content of Schedule of Values: Type schedule on 8-1/2 in. x 11 in. white paper. Contractor's standard forms and automated printout will be considered for approval by Owner's Project Manager upon Contractor's request. Identify schedule with title of Project and location, Owner's Project Manager's project number, name and address of Owner's Project Manager, name and address of Contractor, Contract designation, and date of submission.
 1. Line Item Categories: Follow the Table of Contents of Project Manual for major category items. Further sub-divide the major categories into smaller portions of the work as approved by Owner and Owner's Project Manager.
 2. List installed value of component parts of the Work in sufficient detail to serve as a basis for computing values for progress payments during construction.

- E. Sub-Values: For each major line item, list sub-values of major products or operations under the item.
- F. Overhead and Profit: For the various portions of the Work, include a directly proportional amount of the Contractor's overhead and profit.
- G. Stored Material: For items on which progress payments will be requested for stored materials, break down the value into the following sub-values:
 1. The cost of material, delivered and unloaded at Project Site, with taxes paid.
 2. Installation cost including overhead and profit.

F. The sum of all values listed in the schedule shall equal the total Contract Sum.

1.11 OWNER'S PROJECT MANAGER'S ACTION

- A. General: Owner's Project Manager will review submittals, stamp and indicate action, and return to Contractor. Owner's Project Manager will review submittals for conformance with design intent only. Owner's Project Manager's review and approval of submittals shall be held to limitations stated in the Conditions of the Contract. In no case shall approval or acceptance by

Owner's Project Manager be interpreted as release of Contractor of responsibility to fulfill requirements of Contract Documents. No acceptance or approval of submittals, nor any indication or note marked by Owner's Project Manager on submittals, shall constitute authorization for increase in Contract Sum.

B. Action Stamp: Owner's Project Manager will stamp each submittal with an action stamp. Stamp sample is indicated below:

	1. Reviewed	3. Approved except as noted. Resubmission not required
	2. Approved as noted Resubmission not required	4. Disapproved
<p style="text-align: center;">(Check mark designates action taken)</p> <p style="text-align: center;">Turning Point Engineering</p> <hr/> <p style="text-align: center;">(SIGNATURE) DATE</p> <p style="text-align: center;">Approved for layout and design only. Subject to requirements of specifications. The Contractor shall verify all dimensions in relation to other work before installation.</p>		

C. Other Action: Submittal for information or record purposes will be returned with no action marked.

D. Required Resubmittals: Make corrections or changes to submittals required by Owner's Project Manager and resubmit until approved. Revise initial shop drawings or product data, and resubmit as specified for initial submittal. Indicate changes made other than those requested by Owner's Project Manager. Submit new samples as required for initial submittal.

1.13 REPETITIVE REVIEW

A. Shop Drawings, Product Data and Samples submitted for each item will be reviewed no more than two times at Owner's expense. Submittals failing to comply with Contract requirements will be reviewed at times convenient to the Owner's Project Manager and its consultants and at the Contractor's expense, based upon a flat rate of \$125 per hour, not to exceed \$1,000.00 for each subsequent resubmittal. Contractor shall reimburse Owner for such additional submittal reviews monthly, and the Owner reserves the right to deduct said reimbursement from Contractor's periodic application for payment and the Contract Sum.

1.14 DISTRIBUTION BY CONTRACTOR

A. Distribution: When submittal is marked "REVIEWED", or "APPROVED AS NOTED, RESUBMISSION NOT REQUIRED", make prints and copies and distribute to Owner, subcontractors, suppliers, fabricators, and other parties requiring information from submittal for proper coordination and performance of Work. Print copies of shop drawings from approved reproducible only.

END OF SECTION

01 40 00
QUALITY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including General, Bidding Documents, Contract Forms and Conditions of the Contract, and Division 01 – General Requirements, apply to the work of this Section.

1.02 SUMMARY

- A. Section includes:
 - 1. References.
 - 2. Quality assurance and control of installation.
 - 3. Mockups.
 - 4. Manufacturer's field services and reports.
 - 5. Design data and calculations.
 - 6. Test reports and certifications.
 - 7. Manufacturer's installation instructions.

1.03 REFERENCES

- A. For products or workmanship specified by reference to association, trade, or industry standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Should specified reference standards conflict with Contract Documents, request clarification from Owner's Project Manager before proceeding.
- C. Conform to edition of reference standard in effect as of date of Owner/Contractor Agreement.
- D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 QUALITY ASSURANCE AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Owner's Project Manager before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.05 MOCKUPS

- A. Definition:
 - 1. Mockups are field samples constructed, applied, or assembled at the project site for review by the Owner and Owner's Project Manager that illustrate materials, equipment, or workmanship.
 - 2. Approved mockups establish the standard of quality by which the Work will be judged.
- B. Construct, apply, or assemble specified items, with related attachment and anchorage devices, flashings, seals, and finishes.
- C. Perform work in accordance with applicable specifications sections.
- D. Erect at project site at location acceptable to Owner's Project Manager. Protect from damage.
- E. Removal:
 - 1. Mockups may remain as part of the Work only when so designated in individual specification sections.
 - 2. Do not remove mockups until removal is approved by Owner's Project Manager or upon Final Completion.
 - 3. Where mockup is not permitted to remain as part of the Work, clear area after removal of mockup has been approved by Owner's Project Manager.

1.06 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, or startup of equipment, as applicable, and to initiate instructions when necessary.
- B. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Submit report to Owner's Project Manager within ten (10) days of observation.

1.07 DESIGN DATA AND CALCULATIONS

- A. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide design data and calculations.
- B. Accuracy of design data and calculations is the responsibility of the Contractor.
- C. When so specified, prepare design data and calculations under the direction of a professional engineer licensed in the state in which the Project is located. Affix engineer's seal to submittals.
- D. Submit electronically in Adobe PDF format.

1.08 TEST REPORTS AND CERTIFICATIONS

- A. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide test reports and manufacturers' certifications.
- B. Indicate that material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

- C. Submittals may be recent or previous test results on material or Product, but must be acceptable to Owner's Project Manager.
- D. Submit electronically in Adobe PDF format.

1.09 MANUFACTURER'S INSTALLATION INSTRUCTIONS

- A. When Contract Documents require that Products be installed in accordance with manufacturer's instructions:
 - 1. Submit manufacturer's most recent printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, as applicable.
 - a. Submit in quantities specified for Product Data.
 - b. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
 - c. Identify conflicts between manufacturers' instructions and requirements of Contract Documents.
 - 2. Perform installation of Products to comply with requirements of manufacturer's instructions.
 - 3. If installation cannot be performed in accordance with manufacturer's instructions, notify Owner's Project Manager and await instructions.
 - 4. Submit electronically in Adobe PDF format.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION – 01 40 00

SECTION 01 42 00

REFERENCES

PART 1 GENERAL

1.01 SUMMARY

A. This Section identifies abbreviations and acronyms and includes definitions of words and phrases used in Contract Documents, definitions of standard Specification language, and explanation of Specification format and content.

1.02 QUALITY ASSURANCE

A. Application: When a standard is specified by reference, comply with requirements and recommendations stated in that standard, except when requirements are modified by the Contract Documents or applicable codes establish stricter standards.

B. Publication Date: The publication in effect on the date of issue of Contract Documents, except when a specific publication date is specified.

1.03 ABBREVIATIONS AND NAMES OF ORGANIZATIONS

A. Obtain copies of referenced standards direct from publication source, when needed for proper performance of Work, or when required for submittal by Contract Documents. For abbreviations not listed, and for addresses and phone numbers, refer to the "Encyclopedia of Associations", published by Gale Research Co., Inc., available in most public libraries.

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials.
ACI	American Concrete Institute
ADC	Air Diffusion Council
AGC	Associated General Contractors of America
AIA	American Institute of Owner's Project Managers
AI	Asphalt Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCA	Air Movement and Control Association
ANSI	American National Standards Institute
ARI	Air-Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASPA	American Sod Producers Association
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
CDA	Copper Development Association
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute

EJMA	Expansion Joint Manufacturer's Association
FGMA	Flat Glass Marketing Association
FM	Factory Mutual System
FS	Federal Specification
GA	Gypsum Association
IEEE	Institute of Electrical and Electronics Engineers
IMIAC	International Masonry Industry-All Weather Council
ISA	International Society of Arboriculture
MDOT	Massachusetts Department of Transportation
MFMA	Maple Flooring Manufacturers Association
MIL	Military Specification
ML/SFA	Metal Lath/Steel Framing Association
NAAMM	National Association of Architectural Metal Manufacturers
NCMA	National Concrete Masonry Association
NEBB	National Environmental Balancing Bureau
NEMA	National Electrical Manufacturers' Association
NFPA	National Fire Protection Association
NRCA	National Roofing Contractors Association
NSWMA	National Solid Waste Management Association
NTMA	National Terrazzo and Mosaic Association
NWMA	National Woodwork Manufacturers Association
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PS	Product Standard
SCPI	Structural Clay Products Institute
SDI	Steel Deck Institute
SDI	Steel Door Institute
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joint Institute
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SPRI	Single Ply Roofing Institute
SSPC	Steel Structures Painting Council
TAS	Technical Aid Series
TCA	Tile Council of America, Inc.
UL	Underwriters' Laboratories, Inc.
WCLIB	West Coast Lumber Inspection Bureau

B. The following agencies and publications are included in the specifications for requirements relating to access:

ADA	Americans with Disabilities Act
ADAAG	Americans with Disabilities Act Access Guidelines
MDPS	Commonwealth of Massachusetts Department of Public Safety; Rules and Regulations of the Architectural Barriers Board

1.04 DEFINITIONS

A. General: Basic Contract definitions are included in Document 00 7200, GENERAL CONDITIONS.

B. Indicated: The word "indicated" refers to graphic representations, notes or schedules on Drawings, Paragraphs or schedules in Specifications, and similar requirements in Contract Documents. Terms such as "shown", "noted", "scheduled", and "specified" are used to help locate a reference. No limitation on location is intended except as specifically noted.

- C. Directed: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", and "permitted", are hereby defined as "directed by Owner's Project Manager", "requested by Owner's Project Manager", "authorized by Owner's Project Manager", etc. No implied meaning shall be interpreted to extend the Owner's Project Manager's responsibility into the Contractor's area of construction supervision.
- D. Approve: The term "approved" when used in conjunction with the Owner's Project Manager's action on the Contractor's submittals, applications, and similar requests, is limited to the duties and responsibilities of the Owner's Project Manager as stated in GENERAL CONDITIONS and 00 73 00, MODIFICATIONS TO GENERAL CONDITIONS. Such approval shall not release the Contractor from responsibility to fulfill Contract requirements unless otherwise provided in the Contract Documents.
- E. Furnish: Supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.
- F. Install: Operations at Project Site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- G. Provide: To furnish and install, complete and ready for intended use.
- H. Installer: The Contractor or entity engaged by the Contractor, either as an employee, subcontractor, or sub-subcontractor for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

1.05 SPECIFICATION FORMAT AND CONTENT

- A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 33 Division format and Masterformat numbering system.
- B. Specification Content: These Specifications use certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:
 1. Abbreviated Language: Language used in Contract Documents is abbreviated. Implied words and meanings will be appropriately interpreted. Singular words will be interpreted as plural, and plural words interpreted as singular where applicable.
 2. Imperative Language: In general, imperative language is used in the Specifications. Except where specifically indicated otherwise, the subject of imperative statements is the Contractor. At certain locations in the text, for clarity, subjective language is used to describe responsibilities to be fulfilled indirectly by the Contractor, or others when so noted.

END OF SECTION

SECTION 01 4500
QUALITY CONTROL

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Owner's Project Manager, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Requirements:
 - 1. Divisions 2 through 33 Sections for specific test and inspection requirements.

1.02 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Owner's Project Manager.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.03 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Owner's Project Manager for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Owner's Project Manager for a decision before proceeding.

1.04 ACTION SUBMITTALS

- A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
 - 1. Indicate manufacturer and model number of individual components.
 - 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.05 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Owner's Project Manager.
2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force resisting system quality-assurance plan prepared by Owner's Project Manager.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

1.06 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within 20 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Owner's Project Manager. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule. As a minimum, the quality control plan shall include the following:

1. Contractor's commitment to quality and implementing and managing the QC program.
2. Identification of the Contractor's onsite QC Manager, with name, qualifications, duties and responsibilities. The QC Manager shall have the authority to direct the removal and replacement of non-conforming work. The QC Manager shall be present for all QC meetings, inspections and tests during the project.
3. Procedures for addressing and commenting QC with Contractor's staff, all subcontractors and suppliers, and Owner, Owner's Project Manager and Owner's representative.
4. Procedures for review of submittals and submittal status, and documentation of same.
5. Procedures for pre-installation meetings and documentation of same.
6. Procedures for inspections of deliveries and documentation of same.
7. Procedures for benchmark inspections, defined as initial installations, and documentation of same.
8. Procedures for mockup inspections and documentation of same.
9. Procedures for equipment in place, inspections and documentation of same.
10. Procedures for inspections prior to closures of concealment and documentation of same.
11. Procedures for start-up and commissioning and documentation of same.
12. Procedures for turnover and documentation of same.
13. Procedures for identifying, recording, tracking, correcting, and reporting items requiring rework, using a Rolling Completion list chronological item number, phase area, date listed, description, party responsible for correction, date notified, and date corrected.
14. Procedures for testing and documentation of same.
15. Procedures for corrective action on Owner's Project Manager's Field Reports and Testing Agency reports and documentation of same.

- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 - 1. Project quality-control manager shall not have other Project responsibilities.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
 - 3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Owner's Project Manager has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.07 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.08 QUALITY ASSURANCE

- A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the

experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.
2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection and similar quality-assurance service to Owner's Project Manager and Commissioning Authority with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Owner's Project Manager.
2. Notify Owner's Project Manager seven days in advance of dates and times when mockups will be constructed.
3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Obtain Owner's Project Manager's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
7. Demolish and remove mockups when directed unless otherwise indicated.

L. Integrated Exterior Mockups: Construct integrated exterior mockup as indicated on Drawings.
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Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.

1.09 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
 - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 - 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Owner reserves the right to take samples at random, and perform tests on approved materials delivered to the Project Site to verify compliance of actual materials used on the Project with Contract requirements.
- D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."
- E. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- F. Retesting/ Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- G. Testing Agency Responsibilities: Cooperate with Owner's Project Manager, Commissioning Authority, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Owner's Project Manager, Commissioning Authority, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

H. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

I. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

J. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.

1. Distribution: Distribute schedule to Owner, Owner's Project Manager, Commissioning Authority, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.10 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency or special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
2. Notifying Owner's Project Manager, Commissioning Authority, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Owner's Project Manager and Commissioning Authority with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected

work complies with or deviates from the Contract Documents.

6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Owner's Project Manager.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Owner's Project Manager's, Commissioning Authority's, reference during normal working hours.

3.02 REPAIR AND PROTECTION

- A. On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 1 Section 01700 EXECUTION.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

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TESTING AND INSPECTION SERVICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including General, Bidding Documents, Contract Forms and Conditions of the Contract, and Division 01 – General Requirements, apply to the work of this Section.
- B. Examine all Drawings and all Sections of the Specifications for the requirements and provisions affecting the work of this Section.
- C. Related Work Specified Elsewhere:
 - 1. Individual specifications sections contain specific tests and inspections to be performed.

1.02 SUMMARY

- A. Section includes:
 - 1. Laboratory selection and payment
 - 2. Laboratory duties
 - 3. Contractor's responsibilities.

1.03 REFERENCES

- A. ASTM International (ASTM):
 - 1. C1077 – Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
 - 2. D3666 – Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials.
 - 3. D3740 – Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
 - 4. E329 – Standard Specification for Agencies Engaged in Construction Inspection and/or Testing.
 - 5. E543 – Standard Specification for Agencies Performing Nondestructive Testing.

1.04 QUALITY ASSURANCE

- A. Owner will employ and pay for services of an independent testing laboratory to perform specified testing and inspection.
- B. Contractor shall cooperate with the Testing Laboratory to facilitate performance of its work.
- C. Employment of Testing Laboratory shall in no way relieve Contractor of his obligations to perform work in accordance with Contract Documents.
- D. Refer to the Conditions of the Contract for provisions related to special inspections and testing.
- E. Qualifications of Laboratory:
 - 1. Meet requirements of ASTM C1077, D3666, D3740, E329, and E543.
 - 2. Authorized to operate in State in which project is located.

1.05 LABORATORY DUTIES

- A. Cooperate with Owner's Project Manager and Contractor; provide qualified personnel after due notice.
- B. Perform specified inspections, sampling, and testing of materials and methods of construction:
 1. Comply with specified standards.
 2. Ascertain compliance or noncompliance of materials with requirements of Contract Documents.
- C. Promptly notify Owner's Project Manager and Contractor of observed irregularities or deficiencies of Work or products.
- D. Promptly submit written report of each test and inspection; submit electronically in Adobe PDF format to Owner's Project Manager, Owner, and Contractor.
- E. Each report to include:
 1. Date issued.
 2. Project title and number
 3. Testing Laboratory name, address, and telephone number
 4. Name of Inspector and signature of individual in charge
 5. Date and time of sampling or inspection
 6. Record of temperature and weather conditions
 7. Date of test
 8. Identification of product and specification section
 9. Location of sample or test in project
 10. Type of inspection or test
 11. Results of tests and compliance or noncompliance with Contract Documents
 12. Interpretation of test results when requested by Owner's Project Manager or Contractor.
- F. Perform additional tests when required by Owner's Project Manager or Contractor.
- G. Laboratory is not authorized to:
 1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Approve or accept any portion of work.
 3. Perform any duties of Contractor.

1.06 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with Laboratory personnel, provide access to Work, and to manufacturer's operations.
- B. When materials require testing prior to being incorporated into Work, secure and deliver to Laboratory adequate quantities of representative samples of materials proposed to be used.
- C. Furnish copies of product test reports as required.
- D. Furnish incidental labor and facilities:
 1. To provide access to work to be tested
 2. To obtain and handle samples at site or at source of product to be tested
 3. To facilitate inspections and tests
 4. For safe storage and curing of test samples
- E. Notify Laboratory sufficiently in advance of operations to allow for Laboratory assignment of personnel and scheduling of tests.

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- F. When tests or inspections cannot be performed after such notice, reimburse Owner for Laboratory personnel and travel expenses incurred due to Contractor's negligence.
- G. Make arrangements with Laboratory and pay for additional samples and tests required for Contractor's convenience.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies administrative and procedural requirements for testing laboratory services required for the Project.

1.02 REQUIREMENTS

- A. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the Work of the Contract.
- B. In addition to the Contract's testing, the Owner reserves the right, at his sole discretion, to select and pay for the services of an Independent Testing Laboratory to perform specified services and testing as may be in the Owner's best interest.
- C. Contractor shall cooperate with the laboratory to facilitate the execution of its services.

1.03 RELATED REQUIREMENTS

- A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:
 - 1. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.
 - 2. Respective sections of specifications: Certification of products.

1.04 LABORATORY DUTIES

- A. Cooperate with Owner's Project Manager and Contractor; provide qualified personnel promptly on notice.
- B. Acquaint Owner, Owner's Project Manager, and Contractor's superintendent with testing procedures and with all special conditions encountered at the site.
- C. Inspections, sampling, and testing of materials and construction methods shall be as specified in individual technical specification sections.
 - 1. Comply with specified standards, ASTM, ANSI, and other recognized authorities.
 - 2. Conduct and interpret the tests and state in each report whether the test specimens comply with the requirements, and specifically state any deviations there from.
 - 3. Obtain Contractor's written acknowledgment of each inspection, sampling, and test made.
- D. Promptly notify Owner's Project Manager and Contractor of irregularities or deficiencies of Work or Products which are observed during performance of services.
- E. Promptly submit written report of each test and inspection; one copy each to Owner's Project Manager, Owner, Contractor, and one copy to Project Record Documents File. Each report shall include:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Testing laboratory name, address, and telephone number.

4. Name and signature of laboratory inspector.
5. Date and time of sampling or inspection.
6. Record of temperature and weather conditions.
7. Date of test.
8. Identification of Product and Specification section.
9. Location of sample or test in the Project.
10. Type of inspection or test.
11. Results of tests and compliance with Contract Documents.
12. Interpretation of test results, when requested by Owner's Project Manager.
13. Observations regarding compliance with Contract Documents.

F. Perform properly authorized additional services as required by the Owner.

1.05 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

- A. Laboratory is not authorized to:
 1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Approve or accept any portion of the Work, except as specifically authorized by the specifications.
 3. Perform any duties of the Contractor.

1.06 CONTRACTOR'S RESPONSIBILITIES

- A. Coordinate and cooperate with laboratory personnel, provide access to Work, and to Manufacturer's operations.
 1. Monitor each inspection, sampling, and test.
 2. Provide Laboratory or Agency with written acknowledgment of each inspection, sampling, and test.
 3. Within 24 hours notify Owner's Project Manager and Owner in writing of reasons for not acknowledging Laboratory results.
- B. Secure and deliver to the Laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.
- C. Provide to the Laboratory the preliminary design mix proposed to be used for concrete, and other materials mixes which require control by the testing laboratory.
- D. Furnish copies of Product test reports as required.
- E. Furnish incidental labor and facilities:
 1. To provide access to Work to be tested.
 2. To obtain and handle samples at the Project site or at the source of the Product to be tested.
 3. To facilitate inspections and tests.
 4. For storage and curing of test samples.
- F. Furnish verification of materials and equipment compliance with Contract Documents.
- G. Identify materials to be tested or inspected by Testing Laboratory or Agency.
- H. After determination of need for testing or inspecting by Owner, notify Laboratory sufficiently in advance, minimum five days, of operations to allow for its assignment of personnel and scheduling of tests.
 1. When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to Contractor's negligence.
- I. Make arrangements with laboratory and pay for additional samples and tests required:
 1. For the Contractor's convenience; or

2. When initial tests indicate Work does not comply with Contract Documents.

1.07 CONDUCT OF INSPECTIONS AND TESTS

- A. The Contractor shall notify the Owner, Owner's Project Manager, and Testing Laboratory a minimum of 72 hours before the performance of work to permit the proper conduct of Owner-authorized inspections and tests.
- B. Representatives of Testing Laboratory shall inspect the manufacture, assembly, and placement of materials as required and as authorized by the Owner, and shall report their findings to the Owner's Project Manager, Owner, and Contractor.
- C. Work shall be checked as it progresses, but failure to detect any defective work or materials shall in no way prevent later rejection when such defect is discovered nor shall it obligate the Owner to accept such work.

1.08 TESTS REQUIRED

- A. General Construction Tests: More detailed testing requirements are given in individual Specification Sections. The Owner shall retain the right to make any additional tests the Owner's Project Manager deems necessary or appropriate. The Contractor is responsible for providing his own tests to determine that materials meet specified requirements. The scope of tests required and paid for by the Owner (unless otherwise noted below) shall include as a minimum the following:
 1. Earthwork: Lab tests to determine suitability of all fill materials shall be paid for by Contractor. Owner reserves the right to retain and pay for his own testing for checking purposes.
 2. Earthwork: Proctor tests for compaction.
 3. Asphalt Concrete Paving: Field and lab tests for asphalt paving.
 4. Concrete Paving and General Concrete Work: Concrete mix design testing shall be paid for by Contractor. Owner reserves the right to retain and pay for his own testing for checking purposes
 5. Concrete Paving and General Concrete Work: Concrete test cylinders as specified in Section 03 30 00, CONCRETE.
 6. Wood: Moisture content; treatment retention; strength; dimension.
 7. Sealants: Chemical analysis; adhesive strength; compatibility with adjacent materials; elasticity.
 8. Paints and Finishes: Chemical analysis; coating thickness.
- B. Contractor's Responsibilities: The Contractor shall notify the Owner, Owner's Project Manager, and Testing Laboratory personnel at least 48 hours prior to performance of work requiring testing. The Contractor shall fully cooperate with testing agencies and permit free access to all areas at all times. The Contractor shall permit taking samples at any time during construction, either before or after installation. Prior to notice to proceed with construction, the Contractor shall submit a Testing Log of planned tests and scheduled test dates. Tests shall be numbered based on type of work, type of test, and sequence. The Testing Log shall be maintained by the Contractor in the field office and updated weekly.
 1. Coordination: The Contractor shall coordinate all testing, including all testing and inspections to be paid for by the Owner. The Contractor will arrange testing and sampling performed by the Owner's testing agency and will have prepared test record forms. Upon receipt of test results, the Owner will distribute copies with test results as follows:

Contractor [2 copies].
Owner's Project Manager [2 copies].
- C. Follow-up and Corrective Action: The Contractor and the Owner will note the test record on the Testing Log to acknowledge test procedures and results. If follow-up or corrective action is needed, the Contractor shall submit to the Owner two written copies of proposed follow-up or corrective plans and obtain the Owner's written approval before proceeding.

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- I. Cost of Testing: If tests indicate that materials or work do not comply with requirements, the Contractor shall pay for all retesting, and shall remove and replace non-complying work at no additional cost to the Owner.
- D. Local Owner Inspections: The Contractor is also responsible for coordinating and cooperating with local requirements for inspections.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies construction facilities and temporary controls, including, but not limiting to:

1. Temporary utilities and weather protection.
2. Temporary sanitary facilities.
3. Temporary fire protection.
4. Temporary staging and scaffolding.
5. Temporary hoisting equipment and machinery.
6. Temporary bracing, shoring, sheeting, tie-downs.
7. Construction cleaning and temporary trash containers.
8. Temporary stairs, ladders, ramps, platforms, etc.
9. Temporary fencing, barriers, and partitions.
10. Temporary protective night lighting.
11. Watchmen, police details.
12. Security.
13. Noise, dust, and pollution control.
14. Water control.
15. Protection of new and existing construction.
16. Temporary job signs.
17. Temporary field offices.
18. Temporary storage facilities.
19. Enclosures.
20. Temporary rodent and pest control.
21. Parking facilities and control and construction deliveries.
22. Drinking water.
23. Collection and disposal of waste.
24. Maintenance of streets, walks, and grounds.
25. Municipal police and fire department services.
26. Clean construction

1.02 RELATED REQUIREMENTS

A. Examine Contract Documents for requirements that affect the Work of this Section. Other Specification Sections that directly relate to Work of this Section include, but are not limited to:

1. GENERAL CONDITIONS and Document 00 73 00, MODIFICATIONS TO GENERAL CONDITIONS; Conditions of the Contract.
2. Section 01 11 00, SUMMARY OF WORK.

1.03 SUBMITTALS

A. Schedule: Submit a schedule indicating implementation and termination of each temporary utility within fifteen days of date established for Commencement of the Work.

B. Shop Drawings: Submit shop drawings for all signage.

C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

1.04 QUALITY ASSURANCE

- A. Comply with requirements of authorities having jurisdiction, codes, utility companies, OSHA, and industry standards including, but not limiting to:
 - 1. NFPA 241.
 - 2. NFPA 70.
 - 3. ANSI A10.
 - 4. NECA NJG-6.
- B. Electric Service: Any Temporary Electric Service needed shall be provided by a generator supplied by the contractor.
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test temporary utilities prior to use. Obtain required certifications and permits.

1.05 PROJECT CONDITIONS

- A. Temporary Utilities: At earliest feasible time, when acceptable to Owner, change from use of temporary service to use of permanent service.
- B. Conditions of Use: Maintain temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload temporary facilities. Do not allow hazardous, dangerous, or unsanitary conditions to develop on site.
- C. Maintain the continuity of all utility services at all times across all Phases of the Construction Project, unless otherwise directed by the Owner's Project Manager or Owner.

PART 2 PRODUCTS

2.01 MATERIALS, GENERAL

- A. Materials may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.
- B. Lumber and Plywood: Provide materials as follows:
 - 1. Signs and Directory Boards: Provide exterior grade, Medium Density Overlay (MDO) plywood, conforming to USDC PS1, of size and thickness indicated.
 - 2. Fences, Vision Barriers, and Safety Barriers: Provide exterior grade, C-D veneered plywood.

2.02 TEMPORARY UTILITIES AND WEATHER PROTECTION

- A. Scope: Temporary utility and weather protection work includes, but is not limited to:
 - 1. Temporary weather protection, enclosures, and covers
 - 2. Temporary heating.
 - 3. Water service and distribution.
 - 4. Electric power and light.
 - 5. Telephone service.
- B. As used in this Article, the following terms are used with the specific meanings given below.
 - 1. Construction Electric: The furnishing, installing, maintenance, and removal of all wiring, fusing, switches, outlets, lamps and accessory electrical devices required to furnish lighting and power needed by all construction trades prior to the time such

required lighting and power can be furnished through the permanent electrical distribution system. Include also electrical service for protective night lighting.

2. Construction Water: The furnishing, installing, maintenance, and removal of all water piping, valving, hose bibs, etc. required for all construction trades prior to the time when such requirements can be satisfied by utilizing the permanent supply piping.
3. Interim Electric: The operation and maintenance of the permanent electrical system; from the end of the Construction Electric phase to the Date of Substantial Completion of the Work.
4. Weather Protection: The furnishing, installing, maintenance and removal of temporary closures, covers, shields and any other weather protection devices as required to protecting work in place and permitting construction to proceed during cold or inclement weather.

C. Weather Protection Standard: The following weather protection standards pursuant to Chapter 597 of the Acts of 1980, modifying Sections 44F and G of Chapter 149 of the General Laws, are hereby incorporated into this specification, and shall be considered supplementary to the above temporary heating and temporary enclosure requirements. Under the provisions of Chapter 149, Section 44F (I) and Section 44G, Para. D, of the General Laws, General Contractors are required to provide weather protection to allow building construction to be carried on during the months of November through March. These standards do not require enclosures for heat for operations that are not economically feasible to protect in the judgment of the Awarding Authority; including for example, site work, excavation, pile driving, steel erection, erection of certain exterior panels, roofing and the like.

1. The General Contractor shall provide and install weather protection.
2. Weather protection shall be provided during the months of November through March.
3. Temperature at the working surface shall be at least forty degrees Fahrenheit (40° F.). This provision does not supersede any specific greater requirements for methods of construction or curing of materials.
4. Weather protection materials, equipment, and the installation thereof, shall comply with all safety rules and regulations including provisions for adequate ventilation and fire protection devices.
5. At completion of work, the General Contractor shall remove temporary weather protection and restore all surfaces to first class condition.

E. Weather Protection by Subcontractors: The General Contractor shall provide at his own expense all Weather Protection as defined above except as follows.

1. Each Subcontractor shall pay for and be responsible for the weather protection of his tools, devices, equipment, appliances and appurtenances to be used in the accomplishment of his work and for the weather protection of materials furnished by him until such materials are incorporated as a physical part of the Project.
2. Protection and heating of aggregates and water for concrete and mortars shall be the responsibility and at the expense of the respective Subcontractors furnishing concrete and mortars.

F. The temporary services described above may not be adequate to provide for all of the needs of the General Contractor or all Subcontractors, but are intended only to provide a basis for obtaining filed sub-bids. The General Contractor or any Subcontractor requiring additional temporary services for the proper execution of his work or because of climatic conditions shall arrange for and obtain such services at his own expense without further compensation by the Owner.

2.03 TEMPORARY SANITARY FACILITIES

- A. The General Contractor shall provide suitable toilet facilities for its staff and additional facilities for the workmen on the job, including personnel of Sub-contractors and Filed Sub-contractors.
- B. Provide chemical toilets where work is in progress and in quantity required by OSHA Code.
- C. Chemical toilets and their maintenance shall meet requirements of state and local health

regulations and ordinances and shall be subject to the approval the Owner and Owner's Project Manager.

D. The Owner may designate a specific toilet area to be used for the General Contractor and Sub-contractors engaged in the Work. However, General Contractor shall take responsibility for maintenance and cleaning of such areas and shall leave them in first class condition equal to the accepted conditions of toilet facilities not used for construction personnel.

2.04 TEMPORARY FIRE PROTECTION

A. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

1. Prohibit smoking in construction areas and conspicuously post signs to this effect.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

B. The General Contractor shall take all necessary precautions for the prevention of fire during construction. He shall be responsible that the area within the contract limits is kept orderly and clean and that combustible rubbish is promptly removed from the site. Combustible materials shall be stored on the site in a manner and at locations approved by the Owner's Project Manager. The General Contractor shall comply with all suggestions regarding fire protection made by the insurance company with which the Owner maintains his fire insurance.

C. Smoking shall be prohibited on the premises and signs to this effect shall be posted conspicuously.

D. Fires shall not be built on the premises.

E. Strict safety precautions shall be observed when burning with a torch or using other open flames. Contractor shall provide adequate type and number of portable fire extinguishers so that wherever and whenever a torch or open flame is used, a fire watch armed with an appropriate fire extinguisher shall be used. Comply with requirements of Brookline Fire Department, obtain Hot Work Permit for each day as required, and pay all fees and charges including a firefighter detail (General Contractor and Subcontractor).

2.05 TEMPORARY STAGING AND SCAFFOLDING

A. The General Contractor shall furnish, erect, and maintain in safe condition all exterior and interior staging and scaffolding required for his own use. Where staging and scaffolding over 8 ft. high is required, the Contractor shall provide the entire installation, including the first 8 ft., for the use of all Subcontractors on the project, as required to properly carry out and complete the work, except as may otherwise be specifically provided for in any of the trade sections of this Specification. This staging and scaffolding thus provided shall be without charge to the trades using same.

B. Each of the Subcontractors shall furnish, erect, and maintain in safe condition all exterior and interior staging and scaffolding which does not exceed 8 ft. height for their own use.

C. Staging and Scaffolding shall comply in all respects to the governing laws and codes.

2.06 TEMPORARY BRACING, SHORING, SHEETING, TIE-DOWN

A. The General Contractor shall take all precautions to protect the Work against collapse or other damage by earth or construction loads, high winds, snow and rain loads, damage by adverse weather conditions or geological disturbances, or other cause, by temporary bracing,

shoring, sheeting, guying, lacing, covering, weighting, and other reasonable and prudent means.

2.08 CONSTRUCTION CLEANING AND TEMPORARY TRASH CONTAINERS

A. The General Contractor shall provide temporary dumpster type trash containers outside the building for use by all filed sub-bid and non-filed sub-bid trades, and shall have the containers replaced, hauled away, and the contents legally disposed of at sufficient intervals to maintain them at all times in sufficiently empty condition that they are continuously ready to receive trash and debris.

Excluded from these temporary trash containers shall be (1) all removed existing materials, trash, and debris resulting from demolition operations and (2) all removed materials resulting from site work, including all excavated site materials, whether the work of these categories is by the General Contractor, Filed Sub-Bid Subcontractors, or Non-filed Sub-Bid Subcontractors.

B. Waste materials and rubbish which might otherwise raise dust shall be sprinkled during handling and loading to minimize this effect. Debris shall be carried out of the structure in containers or dropped in fully enclosed chutes and shall not be passed through, or thrown from, windows or other wall openings, and in no case shall be permitted to drop freely therefrom.

C. All waste materials and rubbish shall be disposed of legally, off the-site.

2.09 TEMPORARY STAIRS, LADDERS, RAMPS, PLATFORMS, ETC.

A. The General Contractor shall provide and maintain all necessary temporary stairs, ladders, ramps, platforms, and other temporary construction required for the proper execution of the work, all of which shall comply with requirements of the governing laws and codes. The General Contractor shall also provide and maintain necessary temporary exit stairs at each phase to maintain means of egress for all occupants as required by the governing laws and codes and/or as required by local building officials.

B. As soon as permanent stairs, ladders, ramps, platforms, etc. are erected, the General Contractor shall provide temporary protective wood treads and temporary handrails, or other protection acceptable to the Owner's Project Manager, before the stairs are permitted to be used.

C. After door and fixed glass frames have been installed, the General Contractor shall provide all necessary protective covers and framing required to assure that such items will not be damaged as the work progresses.

2.10 TEMPORARY FENCING, BARRIERS, AND PARTITIONS

A. Protection: The General Contractor shall be fully responsible for security of the work areas of the site and for patrolling and protecting the work under construction and his and the Owner's materials stored or otherwise located on the site.

B. Temporary Construction Fencing: The General Contractor shall furnish and install temporary construction fencing around the project site, generally following the limit-of-work lines, for each of the construction phases, as indicated on the Drawings. Construction fence and gates shall be constructed of new materials and shall be minimum 8 ft. high of either plywood or chain link fence construction. If of chain link fence construction, materials and installation shall conform to "Galvanized Steel Chain Link Fence Fabric" and "Industrial Steel Specifications for Fence Posts, Gates and Accessories" by the Chain Link Fence Manufacturers Institute. Fabric shall be 11 gauge minimum by 2 in. maximum, line posts shall be 2-1/2 in. O.D., end and corner posts 3 in. O.D., and gate posts 4 in. O.D. Concrete footings 3 ft. deep shall be used at all end posts, corner posts, and gate posts. All line posts shall be driven. Top and bottom tension wires shall be used subject to Owner's Project Manager's approval. If of plywood, the fence shall be of exterior grade plywood, with at least C quality sanded veneer to outside, and with wood posts of not less than 4 in. by 4 in. nominal size located not farther than 8 ft. apart.

C. **Temporary Barricading:** In addition, the General Contractor shall provide other temporary fencing, barricading, and overhead protection of substantial nature to protect workmen, other personnel, and the public against various hazards and attendant nuisances that come about as the work progresses such as, but not necessarily limited to, falling materials, dangerous excavations, dangerous projections or obstructions, stored or stock piled materials, etc. Comply fully with recommendations of the Association of General Contractors and provisions of the governing laws and codes.

Note: As part of requirement for overhead protection, include substantial, well constructed, walkway covers sufficient to assure pedestrian safety, in accordance with recommendations of the Association of General Contractors and provisions of the governing laws and codes.

D. In addition, The General Contractor shall provide all necessary protective barriers within the existing building as required to assure the safety of persons and property wherever work of this Contract is being carried out. Include substantial, well constructed, protective barriers at all construction phase work-limit-lines separating Contract work areas from areas occupied by Owner. Also include flameproof dust-curtaining and block or filter mechanical return air systems in a safe manner, in cooperation with Mechanical trade, between areas where dust effusive work is being carried out and other interior areas of the new addition and existing building to prevent passage of dirt and dust. Barriers, curtaining, etc., must be self-supporting, and must not depend on building construction for primary structure or anchorage. Locations and quantities of barriers and dust curtaining shall at all times be subject to Owner's and Owner's Project Manager's approval, but such approval, or lack of inspection or approval, by the Owner or the Owner's Project Manager, shall not be construed as relieving the Contractor of any of his responsibilities under the Contract.

2.11 TEMPORARY PROTECTIVE NIGHT LIGHTING

A. The General Contractor shall be responsible to arrange for adequate outdoor lighting to illuminate stagings, stockpiles, trenches, dangerous projections, excavations and the like as required to protect the safety of workmen, other personnel, and the public and as an aid in the protection against theft and vandalism.

2.12 POLICE DETAILS

A. Contractor shall provide and pay the services of police details as necessary and as required by authorities having jurisdiction.

2.13 SECURITY

A. The Contractor shall continuously maintain the security of each phase of the work being performed. The Contractor shall cooperate with the Owner in particularly sensitive areas where security and special safeguards are required. Contractor shall for adequate protection of interests of Contractor, Owner, and the general public on, or in public ways around, the site. Contractor shall ensure that all windows, doors and other openings in buildings are tightly secured at the end of each workday.

B. The Contractor shall be wholly responsible for patrolling and protecting the work under construction and the materials stored on the site and shall adequately protect the building against theft and vandalism and against fire, windstorm, rain, cold, and other hazards.

2.14 NOISE, DUST, AND POLLUTION CONTROL

A. Work performed under this Contract shall conform to the requirements of Chapter III, Section 31C and Section 142D of the General Laws, Commonwealth of Massachusetts and Rules and Regulations adopted thereto by the Commonwealth of Massachusetts Department of Public Health, and the requirements of local noise, dust, and pollution control laws, ordinances, and regulative agencies applicable to the Work, and to more stringent requirements of the Contract Documents, governing limitation of noise and environmental pollution.

- B. Dust: General Contractor shall provide adequate means for the purpose of preventing dust caused by construction operations from creating a hazard, nuisance, and from entering adjacent occupied areas throughout the period of the construction contract.
 - 1. This provision does not supersede any specific requirements for methods of construction or applicable general conditions set forth in the Contract Articles with added regard to performance obligations of the General Contractor.
- C. Noise: Comply with requirements of authorities having jurisdiction. Develop and maintain a noise-abatement program and enforce strict discipline over all personnel to keep noise to a minimum.
 - 1. Endeavor at all times to maintain as low a level of construction noise as practicable in order not to create a disturbance in the neighborhood in conformance to Brookline Noise Bylaw requirements and other specified requirements.
 - 2. Execute construction work by methods and by use of equipment which will reduce excess noise.
 - a. Equip air compressors with silencers, and power equipment with mufflers.
 - b. Manage vehicular traffic and scheduling to reduce noise.
 - c. No heavy equipment may be started or idled before 7A.M.
 - 3. Any high noise level operations intended to occur during early morning and evening hours or weekends shall be subject to review and approval by Owner prior to proceeding.
 - 4. Any complaints duly registered by Owner of unacceptable noise levels shall be cause for the use of special precautions and methods of operation by Contractor to reduce noise to acceptable levels, at no additional cost to Owner.
 - a. Owner will be the solo judge of the tolerability of noise levels.
- D. General Contractor shall institute all measures required to control the generation of dust and to contain contractor-generated dust, inside and outside the building and to the work areas. Provide substantial dust barriers to conduct dust-laden exhaust air away from occupied spaces so as to cause no nuisance, If necessary to limit objectionable levels of dust, provide dust trapping systems or filters. Provide equipment and air filtration systems to maintain work areas in building at negative pressure with respect to adjacent building areas. Use water fog and mist (riot spray or stream) to dampen dusty areas. Contain waste debris disposal operations in enclosures, chutes and covered containers.
 - 1. If the spread of construction generated dust to neighboring property is found to be objectionable, Contractor shall increase efforts to contain construction dust until acceptable conditions are obtained to the satisfaction of the Owner's Project Manager, at no additional cost to the Owner.
 - 2. Provide workers in dusty areas with protection and safety facilities in accordance with requirements of authorities having jurisdiction.
 - 3. Dust and other debris resulting from work with painted materials or hazardous materials shall be lawfully disposed of, and treatment of hazardous material shall conform to requirements of authorities having jurisdiction.
 - 4. Prevent dust from entering the ventilation systems by covering, sealing, and protecting ductwork, diffusers, grilles, louvers and vents.
 - 5. Protect, cover and seal fire detection and alarm components.
 - 6. Protect, cover and seal light fixtures and lamps.
 - 7. Use tools with directly attached vacuum hoses when engaging in activities that produce dust. Do not sweep using dust control products that contaminate floors with oil or other contamination detrimental to finish floor installation. Do not use compressed air to clean unless vacuums are being used simultaneously.
 - 8. Limit dust to 150 micrograms of airborne, breathable particles per cubic meter of air.

2.15 WATER CONTROL

- A. The General Contractor be responsible for site drainage and snow removal within the Limit-of-Work lines and shall maintain such drainage and removal during the life of the Contract in a manner approved by the Owner and Owner's Project Manager, and so as not to adversely affect the adjacent areas.

- B. Legally remove by pumping, draining, or bailing any water which may accumulate or be found on the site within the contract limits where excavating and grading are to be done, whether from rain surface flow, springs, ground water, backing-up drains or sewers, or from any other cause, at all times, and under any and all circumstances and contingencies that may arise. Form all pump wells, sumps, dams, flumes or other necessary work to keep trenches and excavations entirely clear of water. The General Contractor shall have at all times upon the site, sufficient and satisfactory pumping machinery. Pump wells or well points and underdrains as may be required, shall be provided where needed to properly handle the water. The final trimming excavation shall not be done until de-watering means are in place and in operation.
- C. Water from trenches and excavations shall be disposed of in such manner as will not be a threat to public health nor cause damage to public or private property. It shall not be disposed of over surfaces of roads, walks, and streets, nor be permitted to cause any interference with the normal use of same.
- D. Removal of snow and ice from within the limit-of work lines at the site as required to maintain the continual progress of the work, including that required to keep work areas, access roads, storage areas, clear, free, and in use, and as required to prevent damage to existing construction and new work in place.

2.16 PROTECTION OF NEW AND EXISTING CONSTRUCTION

- A. The Contractor shall protect all new and existing finished surfaces against possible damage from operations under this Contract and shall restore or replace all surfaces that are damaged by operations under this Contract to the original condition, to the satisfaction of the Owner's Project Manager, at no additional expense to the Owner.
- B. When new finished flooring is completed in an area, it shall be protected by the Contractor from dirt and damage by covering with heavy paper or other approved covering. Protective covering shall be replaced if it becomes torn or otherwise damaged.
- C. The Contractor shall keep traffic on roofs to an absolute minimum and shall permit traffic only as required to complete the work under the contract. Protect roof surfaces to prevent damage, and repair or replace damaged roofing and substrates by any necessary means, in accordance with specifications and the requirements and recommendations of the manufacturer of the affected roofing system, to the satisfaction of the Owner's Project Manager, at no additional cost to the Owner.
- D. The Contractor shall not load or allow any part of the structure to be loaded, with a weight that will endanger its safety or the safety of personnel operating in or around the premises.

2.17 TEMPORARY JOB SIGNS

- A. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
 1. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
 2. Maintain and touchup signs so they are legible at all times.
- B. Construction Delivery, Traffic Control, and Site Entrance / Exit Signs:
 1. Provide at all site entrances and exits. Direct deliveries and construction traffic to construction entrances.
 2. Provide 30 by 30-inch aluminum sign panels with vinyl computer cut wording or silkscreen painted. Sign panels to have black text on yellow or orange background. Sign supports to be similar to "37024" Seton Identification Products, www.seton.com.

2.18 TEMPORARY STORAGE FACILITIES

- A. Space for storage of materials shall be confined to the project area limit-of-work lines designated for each Phase, at specific locations as directed or approved by the Owner's Project Manager.
- B. The General Contractor shall provide temporary storage sheds and other covered storage facilities for the storage of materials which are subject to damage by weather, as required.
 - 1. If additional storage is required, Contractor shall obtain and pay for the use of additional storage space, off the site. If payment for materials stored off site is to be requested in any application for periodic payment, storage shall be in a bonded warehouse or other property not owned or under other control of the Contractor or any Subcontractor or supplier, and acceptable evidence of title to the Owner and of adequate insurance shall be delivered with the application for payment.
- C. Prior to completion of construction, when required for the completion of site work, as directed or approved by the Owner's Project Manager, all temporary storage facilities and surplus materials shall be removed from the site.
- D. In the existing building while work therein is being carried on, the General Contractor may use interior areas within the limit-of-work lines for the storage of materials provided such storage, and the handling required thereby, does not damage or overload the new and existing building structure and finishes and that such storage does not interfere with the safe and expeditious performance of the work, nor will create a fire hazard.
- E. Storage of material within the new structure will be permitted only provided such storage, and the handling required thereby, does not damage or overload the building structure, does not damage other completed work and finishes, does not interfere with the safe and expeditious performance of the work, and does not cause a fire hazard.

2.20 ENCLOSURES

- A. Provide temporary, insulated, weather tight closures of openings in exterior surfaces for providing acceptable working conditions and protection for materials, allowing for heating during construction, and preventing entry of unauthorized persons. Provide doors with self-closing hardware and locks.
- B. All utilities Including electric ducts, conduits, telephone lines, sprinklers, and other utilities shall be protected against damage from construction activity. The General Contractor shall be responsible for all damage to the utilities from construction and shall repair all such damage at no additional cost to Owner.

2.21 TEMPORARY RODENT AND PEST CONTROL

- A. Throughout work of the Contract, in all construction Phases, retain a local exterminator or pest control company holding a current license issued by Massachusetts Pesticide Board, and experienced in pest control procedures during construction operations, to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests. Employ this service to perform extermination and control procedures at regular intervals so the Project will be free of pests and their residues at Substantial Completion of each construction Phase and on completion of the entire Work. Perform control operations lawfully, using environmentally safe materials.
- B. Use only rodenticides and pesticides which bear a Federal registration number of the US Environmental Protection Agency and are approved by Massachusetts regulators for the intended application. Contractor shall be liable for injury to persons or domestic animals in the use of toxic materials and shall determine the appropriate materials from the available products for each type of pest and condition of the work. Application of each material shall strictly conform to recommendations and instructions of the manufacturer.
 - 1. Instruct all workers, subcontractors at all tiers, vendors, suppliers and delivery personnel, all personnel of the Owner, Owner's Project Manager, testing agencies, and

all engineering consultants, in writing, concerning the proper sanitation procedures and material storage methods to ensure that rodents and pests are not harbored or attracted to work site or lay down areas.

2. Post warnings and instructions in conspicuous locations throughout the site, acceptable to Owner, and at all storage areas and locations of treatments and toxin applications, as appropriate.
3. Advise property owners and residents in the neighborhood of the site, in writing as approved by the Owner's Project Manager, of measures being taken to control rodents and pest, and of safety procedures for domestic pets at the beginning of each construction Phase and whenever changes in method or recommended safety precautions dictate, as acceptable to Owner's Project Manager.

C. For each Construction Phase, submit a detailed plan for rodent and pest control, coordinated with Contractor's construction schedule, to Owner's Project Manager for information and comment Submit, at start of first construction Phase and whenever a change in products is proposed, complete Product Data sheet for all rodenticides and pesticides proposed for use, including manufacturer's product data, MSDS sheets, and application instructions to Owner's Project Manager for review. Include certifications that materials meet specified regulatory requirements.

D. During construction, submit with Contractor's weekly report to Owner's Project Manager individual reports on activities, including location of sites treated, amounts and types of treatment.

E. Treatment shall be performed at least weekly throughout the entire Project, including areas not within the current Phase Areas as appropriate to rid structures and adjacent areas of rodents and insect pests, and to prevent their migration to other properties around the Project Site. Renew toxic bait and other materials periodically as recommended by manufacturer.

F. Remove rodent carcasses daily and dispose of properly according to law. Maintain refuse containers in first class condition and replace immediately if damaged or otherwise rendered in unacceptable condition. Containers for this application shall be rodent resistant and clearly marked and reserved for this use, with warnings to all personnel that improper use shall result in dismissal. Clean and remove refuse from the work areas, other treated areas, and lay down areas daily. If Contractor fails to have the refuse removed daily, Owner will have the work done by others and deduct the cost of such operations from the Contract Sum.

G. On completion of each construction Phase, and as a condition of Substantial Completion of such Phase, remove remaining exposed bait and other treatments completely, leaving no residue, and dispose of properly according to law. On Substantial Completion of the final construction Phase, remove all bait and treatments as for interim Phases, and remove all refuse containers, notices, and other related facilities, and perform complete inspection of the entire Project to determine recommendations to the Owner of follow up and continuing pest control services.

2.22 PARKING CONTROL AND CONSTRUCTION DELIVERIES

A. The Contractor shall control the use and parking of trucks and construction vehicles to prevent congestion in the vicinity of the Project, conforming to the requirements of Construction Management/ Mitigation Plan prepared by the General Contractor and Phasing Plans in the Drawings. There shall be no idling of construction vehicles on the project site.

2.23 DRINKING WATER

A. Drinking-Water Facilities: Provide containerized, tap-dispenser, bottled-water drinking water, including paper cup supply.

1. Where power is accessible, provide electric water coolers to maintain dispensed water at 45 to 55 deg F.

2.24 DRAINAGE AND SEWERAGE

- A. Sewers and Drainage: If sewers or drains are available, provide temporary connections to remove effluent that may be discharged lawfully. If sewers or drains are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully accessed for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.
- B. Filter out excessive amounts of soil, construction debris, chemicals, oils, and similar contaminants which might clog sewers or pollute waterways before discharge.
 - 1. Connect temporary sewers or to the municipal system, as directed by sewer department officials.
 - 2. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following use, restore normal conditions promptly.
- C. Provide earthen embankments and similar barriers in and around excavations and subgrade construction sufficient to prevent flooding by runoff of storm water from heavy rains.

2.25 COLLECTION AND DISPOSAL OF WASTE

- A. Provide identifiable waste receptacles distributed conveniently around the site and throughout the buildings. Provide separate containers for combustible and non-combustible waste. Collect waste from construction areas and elsewhere daily: waste shall not be left in the buildings overnight, nor in open containers on the site. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.
- B. Do not permit any material to be thrown or discharged from the windows or the roofs of the building.
- C. Packaging materials for all products, materials and equipment shall be promptly removed from the building on unpacking each item.
- D. Provide proper and lawful means of disposal of all wastes generated in the work. Wastewater from cleaning operations, including cleaning of masonry, may contain material that may not be discharged into public sewers, and Contractor shall provide suitable means for holding, filtering and legally disposing of such waste water.

2.26 MAINTENANCE OF STREETS, WALKS, AND GROUNDS

- A. The Contractor shall maintain all access roads and walks in areas under his control clear of debris and obstructions during entire time of the Contract. He shall also be responsible for the repair of off-site Streets, curbs, sidewalks, poles, etc., where disturbed or damaged by operations under this Contract, and leave them in as good condition after completion of the work as before operations started. He shall immediately notify the proper authorities in case of damage to utilities, municipal property, or the Owner's property. Work in public ways shall conform to applicable provisions of the Contract Documents, or to higher requirements of local authorities having jurisdiction.
- B. The Contractor shall remove all snow and ice that may interfere with the work, damage the materials or finishes, adversely affect subsurfaces, impede workers, the public or in any way interfere with the normal progress of the work. Removal shall occur promptly so as to continuously leave roads and walks on the Site and immediately adjacent to the site safe for vehicular and pedestrian passage. Where necessary to maintain access or room for operations, Contractor shall haul snow and ice to a lawful disposal area off the site at no additional cost to the Owner.
- C. No unauthorized entry, passage through, or storage or disposal of materials shall be made upon any part of the site or adjoining property, outside the Contract-limit-lines.

2.27 MUNICIPAL POLICE AND FIRE DEPARTMENT SERVICES

- A. Make all necessary arrangements with the municipal police and fire departments in advance of time when regular off-duty, or reserve police officer or firefighters will be needed for traffic control or fire watch for operations of the Contract. Pay police officers (traffic detail) and firefighters (fire watch) at the prevailing wage rates of the municipality for such services. Extend Workers Compensation Insurance and Employer's Liability Insurance, required under the Contract, to cover police and firefighters used on the Project.
- B. Fire Watch: The contractor or subcontractor (depending on the party responsible for the work) shall provide and pay for a fire watch detail whenever onsite welding, torching, and "hot-work" is being performed. Fire watch shall be a Town of Brookline firefighter.

2.28 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Phase: After Installation of weather barriers but before full enclosure and conditioning of building, when Installed materials are still subject to Infiltration of moisture and ambient mold spores, protect as follows:
 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Periodically collect and remove waste containing cellulose or other organic matter.
 4. Discard or replace water-damaged material.
 5. Do not install material that is wet.
 6. Discard, replace, or clean stored or installed material that begins to grow mold.
 7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
 1. Control moisture and humidity Inside building by maintaining effective dry-in conditions.
 2. Use permanent 1-IVAC system to control humidity.
 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products that become wet during the course of construction and remain wet for 48 hours are considered defective.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Owner's Project Manager.
 - c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

2.29 CLEAN CONSTRUCTION

A. Diesel Emission Control Technology

1. Diesel on-road Vehicles

All diesel on-road vehicles on site for more than 10 total days must have either (1) engines that meet U.S. Environmental Protection Agency (EPA) 2007 on-road emissions standards or (2) emission control technology verified by EPA or the California Air resources Board (CARB) to reduce PM emissions by a minimum of 85%.

2. Diesel Generators

All diesel generators on site for more than 10 total days must be equipped with emission control technology verified by EPA or CARB to reduce PM emissions by a minimum of 85%.

3. Diesel Nonroad Construction Equipment

- a. All nonroad diesel engines on site must be Tier 2 or higher. Tier 0 and Tier 1 engines are not allowed on site.
- b. All diesel nonroad construction equipment on site for more than 10 total days must have either (1) engines meeting EPA Tier 4 nonroad emission standards or (2) emission control technology verified by EPA or CARB for use with nonroad engines to reduce PM emissions by a minimum of 85% for engines 50hp and greater and by a minimum of 20% for engines.
4. Upon confirming that the diesel vehicle, construction equipment, or generator has either an engine meeting Tier 4 non-road emissions standards or emission control technology, as specified above, installed and functioning, the Owner will issue a compliance sticker. All diesel vehicles, construction equipment, and generators on site shall display the compliance sticker in a visible, external location as designated by the Owner.
5. Emission control technology shall be operated, maintained, and serviced as recommended by the emission control technology manufacturer.
6. All diesel vehicles, construction equipment, and generators on site shall be fueled with ultra-low sulfur diesel fuel (ULSD) or a biodiesel blend approved by the original engine manufacturer with sulfur content of 15 ppm or less.

B. Idling Requirements

During periods of inactivity, idling of diesel on-road vehicles and nonroad equipment shall be minimized and shall not exceed five minutes in any sixty-minute period accept as allowed under the Town's bylaw (7.5.8) and MGL Chapter 90; section 16A.

C. Exemptions

1. On-road diesel vehicles, nonroad construction equipment, and generators on site for 10 working days or less over the life of the project need not install emission control technology. This equipment must be included on the equipment list submitted by the contractor and approved by the developer.
2. If the contractor can prove to the Owner's satisfaction that for a particular class of on-road diesel vehicle, nonroad construction equipment, or generator, (1) no alternative equipment with a Tier 4 engine is available, (2) it is not technically feasible to meet the control level specified above with a verified device, or (3) installing the control device would create a safety hazard or impaired visibility for the operator, then the contractor may, with the Owner's written approval, drop down to a lower level of control.
3. The Owner's representative may create an exemption when there is a compelling emergency need to use diesel vehicles or engines that do not meet the contract

conditions for emission controls. An example would be the need for rescue vehicles or other equipment to prevent or remedy harm to human beings or nearby property. Meeting contract deadlines, failure to rent equipment in a timely manner, planned unavailability, or lack of advance planning are not considered compelling emergencies.

4. The Owner may provide an exemption lasting no more than 30 days to a contractor, if the contractor can prove with valid documentation and to the Owner's satisfaction that the appropriate emission control equipment has been ordered in a timely manner after the bid was awarded but has yet to be installed due to delays attributable to the equipment manufacturer and beyond the control of the contractor. The contractor must install the retrofit as soon as practicable once it has been delivered and shall submit proof thereof when installation is complete. Provided, however, that such exemption shall not be available to a contractor who already owns an equivalent piece of equipment that meets the engine requirements for the project, as the contractor may use that piece of equipment.

D. Additional Diesel Requirements

1. Construction shall not proceed until the contractor submits a certified list of all diesel vehicles, construction equipment, and generators to be used on site. The list shall include the following:
 - a. Contractor and subcontractor name and address, plus contact person responsible for the vehicles or equipment.
 - b. Equipment type, equipment manufacturer, equipment serial number, engine manufacturer, engine model year, engine certification (Tier rating), horsepower, engine serial number, and expected fuel usage and hours of operation.
 - c. For the emission control technology installed: technology type, serial number, make, model, manufacturer, EPA/CARB verification number/level, and installation date and hour-meter reading on installation date.
2. If the contractor subsequently needs to bring on site equipment not on the list, the contractor shall submit written notification within 24 hours that attests the equipment complies with all contract conditions and provide information asked for in the paragraph above
3. All diesel equipment shall comply with all pertinent local, state, and federal regulations relative to exhaust emission controls and safety.
4. The contractor shall establish generator sites and truck-staging zones for vehicles waiting to load or unload material on site. Such zones shall be located where diesel emissions have the least impact on abutters, the general public, and especially sensitive receptors such as hospitals, schools, daycare facilities, elderly housing, and convalescent facilities.

E. Reporting

1. For each on-road diesel vehicle, nonroad construction equipment, or generator, the contractor shall submit to the Owner's representative a report prior to bringing said equipment on site that includes:
 - a. Equipment type, equipment manufacturer, equipment serial number, engine manufacturer, engine model year, engine certification (Tier rating), horsepower, and engine serial number
 - b. The type of emission control technology installed, serial number, make, model, manufacturer, and EPA/CARB verification number/level
 - c. The Certification Statement signed and printed on the contractor's letterhead.

2. The contractor shall submit to the Owner's representative a monthly report that, for each on-road diesel vehicle, nonroad construction equipment, or generator onsite, includes:
 - a. Hour-meter readings on arrival on-site, the first and last day of every month, and on off-site date
 - b. Any problems with the equipment or emission controls.
 - c. Certified copies of fuel deliveries for the time period that identify:
 - i. Source of supply
 - ii. Quantity of fuel
 - iii. Quality of fuel, including sulfur content (percent by weight).

F. Compliance

All on-road diesel vehicles, nonroad construction equipment, and generators must be compliant with these provisions whenever they are present on the project site.

G. Non-Compliance

1. If any on-road diesel vehicle, nonroad construction equipment, or generator is found to be in non-compliance with the contract terms, the equipment will be immediately removed from the job site.
2. Once the contractor has brought previously non-compliant machinery into compliance, the Owner's representative shall promptly issue the contractor a written acknowledgment of compliance.

H. Costs

All costs associated with the acquisition and installation of emission control technology are considered incidental to the cost of the project; no additional compensation will be provided.

PART 3 EXECUTION

3.01 MAINTENANCE, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit waste and abuse.
- B. Maintenance: Maintain temporary facilities in operating condition; repair damages immediately upon discovery. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour per day basis.
- C. Termination and Removal: Unless otherwise requested by Owner or Owner's Project Manager, remove each temporary facilities when no longer useful, or when replaced by permanent facility. Clean and renovate permanent facilities that have been used during construction period, including:
 1. Replace air filters and clean inside of ductwork and housings.
 2. Replace worn parts.
 3. Replace lamps.

END OF SECTION

01 54 00
CONSTRUCTION AIDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including General, Bidding Documents, Contract Forms and Conditions of the Contract, and Division 1 General Requirements, apply to the work of this Section.
- B. This section applies to all work performed under the Contract and is inherently made a part of each specification section.
- C. Related work specified elsewhere:
 - 1. Section 01 50 00 – Temporary Facilities and Controls
 - 2. Section 01 74 19 – Construction Waste Management and Disposal

1.02 SCOPE OF WORK

- A. Provide and maintain construction aids and equipment for common use and to facilitate execution of the work:
 - 1. Scaffolds, staging, fixed ladders, chutes, cranes, hoists, platforms, railings, ramps, runways, stairs, and other such facilities and equipment.
 - a. Except as otherwise indicated for Filed Sub-Bid contractors.
- B. Each Contractor: Provide and maintain for his own forces all other construction aids required to complete his work:
 - 1. Portable ladders, man lifts, and other such facilities and equipment
- C. Modify or remove as required to accommodate construction until work is completed.

1.03 QUALITY ASSURANCE

- A. Nothing in the specification shall be interpreted as contrary to minimum safety requirements of OSHA and other regulatory authorities. In case of conflict, the strictest regulation shall govern.
- B. The Contractor shall be completely responsible for the safety of his personnel at the job site, and take all necessary precautions to ensure their safety and that of the general public.

1.04 COORDINATION

- A. Construction aids and equipment installed for common use shall remain installed until all trades have completed work requiring said construction aids and equipment.
- B. In the event that specific construction aids, including but not limited to cranes and hoists, are temporarily available, coordinate work with other trades to maximize use and limit need for additional future construction aids.

1.05 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with Federal, State and Local codes and regulations.

1.06 MAINTENANCE OF THE SITE

- A. The General Contractor shall provide all necessary safety equipment, materials and personnel, to protect the public walks, entrances to the buildings, grounds within the work areas of this Contract in order that pedestrians, automobiles and the public be protected at all times. The General Contractor shall post signs for safety as required by code.
- B. The General Contractor shall provide and keep in repair all bridging and decking necessary to maintain vehicular and pedestrian traffic.
- C. Each Contractor shall adequately enclose and protect areas against the weather where the installation is incomplete at the end of the working day, and shall be responsible for any damage or inconvenience due to his failure to do so. Such protection shall be done to the complete satisfaction of the owner.
- D. Each Contractor shall properly and completely protect all apparatus included in this Contract against dirt and damage. Each Contractor shall be held fully responsible for all damage to apparatus, regardless of whether provided by him or belonging to the owner, until final acceptance. Any equipment furnished under the Contract and any property of the owner damaged or destroyed by any Contractor or his employees shall be restored to its original condition or replaced without additional cost to the owner.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Materials may be new or used, suitable for the intended purpose, but shall not violate requirements of applicable codes and standards.
- B. All materials for the scaffolding shall be in good condition. Damaged or unsuitable materials shall be removed and replaced as directed by the Engineer. Materials shall be as defined in Subpart L of the Code of Federal Regulations Sections 1926.450 Ladders, 1926.451 Scaffolding and 1926.105 Safety Nets, as provided by the U.S. Occupational Safety and Health Administration.

2.02 CONSTRUCTION AIDS

- A. When permanent stair framing is in place, provide temporary treads, platforms and railings for use by construction personnel.

2.03 SCAFFOLDING

- A. Scaffolding shall conform to all requirements of public agencies having jurisdiction thereof.
 1. Where an authority having jurisdiction does not supersede these requirements, scaffolding shall:
 - a. Be designed for a minimum live load of 50 PSF.
 - b. Anchorages to the existing building shall have a minimum factor of safety of 2.0 against uplift or failure.
 - c. Patent scaffolding shall be installed to the manufacturer's specifications.
 2. The extent of scaffolding and fixed platform shall be such that all elements of the work performed can be easily accessible for workers and inspections and all necessary work safety performed.
- B. Scaffolding shall be erected in such a manner as not to disturb any parts of existing buildings. All necessary provisions shall be made to protect all property from damage and public against hazard or injury.

2.04 ACCESS

- A. Access platforms and ladders shall be provided to permit easy and safe access to the scaffolding at the work area. Where intermediate rather than continuous scaffolding is used, there shall be access ladders and/or platforms fixed securely at each station, which shall remain in place for the duration of the project.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Consult with Owner's Project Manager, review site conditions and factors which affect construction procedures and construction aids, including adjacent properties and public facilities which may be affected by execution of the work.

3.02 CONSTRUCTION METHOD

- A. The Contractor shall design and provide scaffolding.

3.03 DISMANTLING AND REMOVAL

- A. Relocate construction aids as required by progress of construction, by storage or work requirements, and to accommodate legitimate requirements of Owner and other Contractors employed at the site.
- B. Remove temporary materials, equipment and services:
 1. When construction needs can be met by authorized use of permanent construction or when authorized by the Owner's Project Manager.
 2. At completion of the project.
- C. Clean and repair damage caused by installation or use of temporary facilities.
- D. Restore facilities used for temporary purposes to original condition.

END OF SECTION – 01 54 00

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. This Section specifies administrative and procedural requirements for materials and equipment used for the Project.

1.02 RELATED REQUIREMENTS

- A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. GENERAL CONDITIONS and Document 00 73 00, MODIFICATIONS TO GENERAL CONDITIONS.
2. Section 01 11 00, SUMMARY OF WORK.
3. Section 01 33 00, SUBMITTAL PROCEDURES
4. Section 01 60 10 PROJECT PRODUCTS
4. Section 01 77 00, CLOSEOUT PROCEDURES

1.03 MATERIAL AND EQUIPMENT INCORPORATED INTO THE WORK

- A. Conform to applicable specifications and standards.

- B. Comply with size, make, type and quality specified, or as specifically approved in writing by the Owner's Project Manager.

- C. Manufactured and Fabricated Products:

1. Design, fabricate and assemble in accord with the best engineering and shop practices.
2. Manufacture like parts of duplicate units to standard size and gages, to be interchangeable.
3. Two or more items of the same kind shall be identical, by the same manufacturer.
4. Products shall be suitable for service conditions.
5. Equipment capacities, sizes, and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.

- D. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

- E. No asbestos containing products or lead containing products shall be permitted on this Project.

- F. All finishes and materials used in this Project shall be low V.O.C.

1.04 WORKMANSHIP

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

- B. Perform work by persons qualified to produce workmanship of specified quality.

- C. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.05 MANUFACTURERS' INSTRUCTIONS

- A. When work is specified to comply with manufacturers' instructions, submit copies of said instructions, as specified in Section 01 3300, SUBMITTAL PROCEDURES, distribute copies to persons involved, and maintain one set in field office.
- B. Perform work in accordance with details of instructions and specified requirements. Should a conflict exist between Specifications and manufacturer's instructions, consult with Owner's Project Manager.

1.06 TRANSPORTATION AND HANDLING

- A. Arrange deliveries of products in accord with construction schedules, coordinate to avoid conflict with work and conditions at the site.
- B. Transport Products by methods to avoid Product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.
- C. Provide equipment and personnel to handle Products by methods to prevent soiling or damage.
- D. Promptly inspect shipments to assure that Products comply with requirements, quantities are correct, and products are undamaged.

1.07 STORAGE AND PROTECTION

- A. Store Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive Products in weather tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.
- B. For exterior storage of fabricated Products, place on sloped supports above ground. Cover Products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.
- C. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.
- D. Arrange storage to provide access for inspection. Periodically inspect to assure Products are undamaged and are maintained under required conditions.
- E. After installation, provide coverings to protect Products from damage from traffic and construction operations, remove when no longer needed.

1.08 PRODUCT OPTIONS

- A. Within 30 days after date of Contract, submit complete list of major Products proposed, with name of manufacturer, trade name, and model.
- B. Options:
 1. Products specified only by reference standard: Any Product meeting that standard.
 2. Products specified by naming several manufacturers: Products of any named manufacturer meeting Specifications.
 3. Products specified by naming one or more manufacturers and "or equal": Submit a request for substitution for any manufacturer not specifically named.

1.09 MATERIAL SUBSTITUTIONS

- A. Substitutions of products shall comply with requirements of Chapter 30, Section 39M of General Laws, and additional requirements and procedures specified herein.
- B. Where products or materials are specified by manufacturer's name, trade name or catalog reference, the words "or approved equal" shall be understood to follow unless there is a statement specifically indicating that no substitution will be allowed. An item shall be considered equal to the item so named or described if in the opinion of the Owner's Project Manager:
 - 1. It is at least equal in quality, durability, appearance, strength and design; including compliance with applicable specifications and compatibility with physical space allocations provided for the item;
 - 2. It performs at least equally the function imposed by the general design for the work;
 - 3. It conforms substantially, even with deviations to the detailed requirements for the item as indicated by the Contract Documents.
- C. Should the Contractor, after the award of the Contract, wish to use any products or materials other than those specified, he shall request written permission of the Owner's Project Manager using Substitution Request Form - **refer to Section 00 63 25 Substitution Request Form**. The request shall name and adequately describe (including shop drawings) the proposed substitutions, furnish any information requested by the Owner's Project Manager, and state what difference, if any, will be made in the Contract price, including the cost of changes in the Work, for such substitutions should they be accepted. Upon receipt of complete information from the Contractor, the Owner's Project Manager will consider all aspects of the proposed substitution and advise the Contractor in writing approving or disapproving the substitution. The principal reasons for approval or disapproval of the substitution will be enumerated by the Owner's Project Manager. Disapproval of the substitution shall not be cause for an increase in Contract price or a delay in schedule.
- D. Request constitutes a representation that Contractor:
 - 1. Has investigated proposed Product and determined that it meets or exceeds, in all respects, specified Product.
 - 2. Will provide the same warranty for substitution as for specified Product.
 - 3. Will coordinate installation and make other changes which may be required for Work to be complete in all respects.
 - 4. Waives claims for additional costs which may subsequently become apparent.
- E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals without separate written request, or when acceptance will require substantial revision of Contract Documents.
- F. Owner's Project Manager will determine acceptability of proposed substitution, and will notify Contractor of acceptance or rejection in writing within a reasonable time.

END OF SECTION

SECTION 01 73 00
EXECUTION

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
 - 9. Correction of the Work.
- B. Related Requirements:
 - 1. Division 1 Section 01 11 00 SUMMARY OF WORK for limits on use of Project site.
 - 2. Division 1 Section 01 33 00 SUBMITTAL PROCEDURES for submitting surveys.
 - 3. Division 1 Section 01 77 00 CLOSEOUT PROCEDURES for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.02 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.03 INFORMATIONAL SUBMITTALS

- A. Make Submittals in accordance with Division 1 Section 01 33 00 SUBMITTAL PROCEDURES.
- B. Qualification Data: For land surveyor.
- C. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- D. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.

3. Products: List products to be used for patching and firms or entities that will perform patching work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

1.04 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Owner's Project Manager for the visual and functional performance of in- place materials.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated,

for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work.
2. List of detrimental conditions.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.02 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Owner's Project Manager according to requirements in Division 01 Section "Project Management and Coordination."

3.03 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Owner's Project Manager promptly.
- B. Engage a land surveyor to lay out the Work using accepted surveying practices.
 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - a. Make no changes or relocations without prior written notice to Owner's Project Manager.

- b. Report to Owner's Project Manager when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- c. Require surveyor to replace Project control points which may be destroyed.
 - 1. Establish replacements based on original survey control.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 4. Inform installers of lines and levels to which they must comply.
 - 5. Check the location, level and plumb, of every major element as the Work progresses.
 - 6. Notify Owner's Project Manager when deviations from required lines and levels exceed allowable tolerances.
 - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Owner's Project Manager.

3.04 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Owner's Project Manager. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Owner's Project Manager before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and site work.
- E. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements, and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 - 2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.05 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produces harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Owner's Project Manager.
 - 2. Allow for building movement, including thermal expansion and contraction.

3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.06 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
 - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 - 2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.07 PROGRESS CLEANING

- A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01 Section "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.08 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Division 1 Section 01 9113 GENERAL COMMISSIONING REQUIREMENTS.
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Division 1 Section 01 4000 QUALITY REQUIREMENTS

3.09 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

01 73 29

CUTTING AND PATCHING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including General, Bidding Documents, Contract Forms and Conditions of the Contract, and Division 1 General Requirements, apply to the work of this Section.
- B. Examine all Drawings and all Sections of the Specifications for the requirements and provisions affecting the work of this Section.
- C. Related Work Specified Elsewhere:
 - 1. Section 01 74 00 – Dust Control
 - 2. Section 01 74 19 – Construction Waste Management and Disposal
- D. Entire set of contract documents, including specifications, addenda, and drawings inclusive may contain work items that require demolition and removal.

1.02 SCOPE OF WORK

- A. The Contractor shall furnish and install all necessary labor, materials, equipment, services, tools and any other incidentals necessary to perform the work.
- B. All demolition, removal, and disposal Work shall be in compliance with the requirements of the Building Code of the Commonwealth of Massachusetts and with all local and Federal regulations

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CUTTING

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Temporary Support: Provide temporary support of work to be cut.
- C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements of Division 01.

3.02 PATCHING

- A. Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
- B. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

END OF SECTION – 01 73 29

01 74 00

DUST CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including General, Bidding Documents, Contract Forms and Conditions of the Contract, and Division 01 – General Requirements, apply to the work of this Section.
- B. Examine all Drawings and all Sections of the Specifications for the requirements and provisions affecting the work of this Section.
- C. Related Work Specified Elsewhere:
 - 1. Section 01 74 19 – Construction Waste Management and Disposal

1.02 SCOPE OF WORK

- A. The Contractor shall furnish and install all necessary labor, materials, equipment services, tools and other incidentals necessary for the following:
 - 1. Employ dust control procedures as hereafter specified throughout all work of this contract.
 - 2. Provide all other labor and materials as may be reasonably inferred to be required to make the work of this Section complete.

1.03 SUBMITTALS

- A. General: Submit the following in accordance with the Conditions of the Contract and Division 1 Specification Sections.
 - 1. Cleaning Solution: Manufacturer's literature.

1.04 REQUIREMENTS AND RESTRICTIONS

- A. All Materials from Cleanup shall be legally disposed of.
- B. **NOTIFY OWNER'S PROJECT MANAGER AND THE OWNER IMMEDIATELY IF HAZARDOUS MATERIAL IS FOUND DURING REMOVAL PROCESS. SECURE THE SITE AND LEAVE SUSPECT MATERIALS ALONE UNTIL COURSE OF ACTION IS DETERMINED.**
 - 1. For new materials brought on to the site, it is the contractor's responsibility to have an independent testing agency test and advise on toxic content.

PART 2 - PRODUCTS

2.01 CLEANING SOLUTION

- A. Cleaning solution shall not contain trisodium phosphate (TSP).
- B. Approved manufacturers:
 - 1. Savogran TSP-PF
 - 2. Simple Green
 - 3. Ledizolv
 - 4. Or approved equal.

PART 3 - EXECUTION

3.01 PURPOSE

- A. The purpose of these procedures is to assure that dust and debris are limited to the work area.

3.02 WORK AREA PREPARATION

- A. Cover entrances to the work area with a single layer of 6 mil polyethylene sheets taped to the top and weighted at bottom.
- B. Place drop cloths of 6 mil polyethylene sheets adjacent to surfaces to be disturbed. The drop cloth shall be at least 5 feet wide. The same drop cloth may be used to wrap components to be removed.
- C. Protect The Awarding Authority's Property and occupant belongings in work areas by covering them with 6 mil polyethylene sheets secured with duct tape.

3.03 DUST CONTROL PROCEDURES

- A. Use wet methods when demolishing walls or other components that produce dust during demolition. Mist all surfaces to be disturbed with a fine spray of water.
- B. Use power tools where possible. Power tools shall be equipped with a HEPA vacuum capable of trapping and retaining 99.97% of all particles 0.3 micrometers in diameter or greater.
- C. Wrap all materials to be removed in 6 mil polyethylene bags tied with at least 5" long plastic ties. Alternatively, clean by wet methods or HEPA vacuum prior to transport from the work area.
- D. Avoid spreading dust and debris outside the work area.

3.04 CLEAN-UP PROCEDURES

- A. Remove all accumulations of waste before conducting clean-up procedures.
- B. Mist debris with water prior to sweeping (no dry sweeping) and utilize HEPA vacuums to clean all surfaces.
- C. Vacuum all floors, and surfaces that might accumulate dust.
- D. Wet mop entire area using approved cleaning solution.
- E. Legally dispose of materials from clean-up. Do not discard them in trash cans.

END OF SECTION – 01 74 00

01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including General, Bidding Documents, Contract Forms and Conditions of the Contract, and Division 01 – General Requirements, apply to the work of this Section.
- B. Examine all Drawings and all Sections of the Specifications for the requirements and provisions affecting the work of this Section.
- C. Related work specified elsewhere:
 - 1. Section 01 74 00 – Dust Control

1.02 SCOPE OF WORK

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous construction waste.
 - 2. Recycling nonhazardous construction waste.
 - 3. Disposing of nonhazardous construction waste.

1.03 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Disposal: Removal off-site of construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- C. Recycle: Recovery of construction waste for subsequent processing in preparation for reuse.
- D. Salvage: Recovery of construction waste and subsequent sale or reuse in another facility.
- E. Salvage and Reuse: Recovery of construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 75 percent by weight of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:
 - 1. Construction Waste:
 - a. Site-clearing waste.
 - c. Lumber.
 - d. Wood sheet materials.
 - e. Wood trim.
 - f. Metals.

- g. Packaging: Regardless of salvage/recycle goal indicated in paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.
 - 7) Plastic pails.
2. All other readily recycled materials.

1.05 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 30 days of date established for the Notice to Proceed.

1.06 QUALITY ASSURANCE

- A. Waste reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
 1. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
 2. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
 3. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
 4. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

3.02 RECYCLING CONSTRUCTION WASTE, GENERAL

- A. General:
 1. Recycle paper and beverage containers used by on-site workers.
 2. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall be shared equally by Owner and Contractor.
 3. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- B. Procedures:
 1. Separate recyclable waste from other waste materials, trash, and debris.

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Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.

- a. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
2. Inspect containers and bins for contamination and remove contaminated materials if found.
3. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

C. Best Practices:

1. Use industry standard best practices to manage products legally and appropriately, including batteries, fluorescent lamps, and other items requiring special attention.

3.03 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 1. Except as otherwise specified, do not allow waste materials that are to be disposed of to accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 3. Burning: Do not burn waste materials.
 4. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION – 01 74 19

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements during contract closeout, including, but not limited to:

1. Punch list Requirements
2. Substantial Completion.
3. Final Acceptance.
4. Record document submittal.
5. Operating and maintenance data.
6. Instruction of Owners personnel
7. Warranties and bonds
8. Materials and finishes manual
9. Final cleaning.

1.02 RELATED REQUIREMENTS

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. GENERAL CONDITIONS, and Document 00 73 00, MODIFICATIONS TO GENERAL CONDITIONS; Fiscal provisions, legal submittals, and additional administrative requirements.
2. Section 01 11 00, SUMMARY OF WORK; Owner occupancy.
3. Respective Sections of Specifications: Closeout Submittals for work of the Section.

1.03 PUNCH LIST REQUIREMENTS

A. Definitions:

1. Contractor's Punch List: Complete list of incomplete and incorrect Work prepared by the Contractor prior to request of Owner's Project Manager's inspection for Certification of Substantial Completion. As a minimum the List shall include the following information for each work item:
 - a. Clear identification of each incomplete work item, including all subcontractor's work.
 - b. Estimated value of each incomplete work item.
 - c. A short statement of why work is not complete.
 - d. Identify subcontract responsibility, as appropriate to each item.

2. Owner's Project Manager's Punch List: A list of Incomplete and incorrect Work prepared by the Owner's Project Manager, which modifies the Contractor's Punch List, following review and acceptance of the Contractor's Punch List. Owner's Project Manager's punch list is limited to one. Additional requests for punch list visits will be back-charged to Contractor.
- B. Pre-Closeout requirements: Prior to requesting initial Owner's Project Manager's inspection for Certification of Substantial Completion, submit to the Owner's Project Manager a full and complete list of all incomplete work items (Contractor's Punch List).
- C. Punch list procedures at Substantial Completion:
 1. Owner's Project Manager will review submitted Contractor's Punch List and determine whether it is suitable to proceed with the Substantial Completion Process.
 - a. If the Owner's Project Manager determines that the amount of completed work is insufficient to be considered for Substantial Completion, the Owner's Project Manager will not proceed with the Punch lists process until sufficient completion of the Project is achieved.
 - b. The Owner's Project Manager will review the Contractors Punch List and if the Owner's Project Manager determines that it does not reflect proper identification of the incomplete and incorrect work, he/she will request revision and resubmission of the Contractor's Punch List.
 - c. If the Owner's Project Manager determines that the amount of work indicated on the Contractor's Punch List is excessive, the Owner's Project Manager will suspend its review until the scope of Work identified in the Contractor's Punch is reduced to a level satisfactory to the Owner's Project Manager.
 - d. When the Owner's Project Manager reviews and accepts the Contractor's Punch List as being an accurate reflection of incomplete and incorrect work; the Owner's Project Manager will prepare and issue to the Contractor the 'Owner's Project Manager's Punch List.'
 - 1) The Owner's Project Manager's Punch List will be based on the Contractor's Punch List with modifications and additions as may be required.
 - 2) The Owner's Project Manager's Punch List includes Work which must be completed and corrected prior to Final Completion.
 2. Upon receipt of the Owner's Project Manager's Punch List, the Contractor shall immediately distribute the list to all subcontractors.
- D. Completion of Punch List Work: Make reasonable efforts to ensure that all "Owner's Project Manager's Punch List" items are completed or corrected within 14 calendar days from the date of the Owner's Project Manager's Punch List" or within the Contract Time, whichever is earlier.
- E. Owner's Project Manager's Final Inspection and review of Punch List Work:
 1. After Contractor certification that all punch list Work has been properly completed the Owner's Project Manager will then perform the Final Inspection.

- a. Incomplete Items: If the Owner's Project Manager discovers any incomplete or incorrect "Owner's Project Manager's Punch List" items or any other deficiency in the work, the Owner's Project Manager will prepare a "Revised Punch List" which may also include other incomplete Contract requirements such as record documents, owner's operation and maintenance manuals, warranties, and other Contract requirements. Owner's Project Manager's site reviews of the Work for this "Revised Punch List" and any subsequent revised Punch Lists shall be performed as additional service to Owner and back-charged to the Contractor.
- b. The Owner's Project Manager may assign a dollar value for each item of incomplete or incorrect work remaining.

F. Additional Inspections and related additional services fee: The Owner's Project Manager and the Owner's Project Manager's consultants will provide two site inspections, one at Substantial Completion, and one to confirm that the "Owner's Project Manager's Punch List" has been completed.

1. Revised Punch List: If the Owner's Project Manager prepares and issues a "Revised Punch List" because of the Contractor's failure to complete the Work, then the Owner shall compensate the Owner's Project Manager and the Owner's Project Manager's consultants for their additional services and additional inspections. The payment for additional services and inspections will be back-charged to Contractor. The Owner will deduct the amount of the Owner's Project Manager's additional services fee from final payment to the Contractor by Change Order.

1.03 SUBSTANTIAL COMPLETION

A. Prior to requesting inspection for certification of Substantial Completion, complete the following:

1. On Application for Payment, show 99% completion for portions of work claimed as substantially complete. Submit list of incomplete items (Punch List), value of incomplete work, and reasons work is not complete.
2. Obtain evidence of compliance with requirements of governmental agencies having jurisdiction including, but not necessarily limited to:
 - a. Certificate of Final Inspections, "signed off" by authorities having jurisdiction.
 - b. Certificate of Occupancy.
3. Submission of product and installation warranties, workmanship bonds, maintenance agreements, Installer certifications and similar documents specified in individual sections.
4. Submission of approved test/adjust/balance reports.
5. Submission of maintenance instructions.
6. Deliver to Owner and obtain receipts for:
 - a. Operation and Maintenance Manuals for items so listed in individual Sections of the Specifications, and for other items when so directed by the Owner's Project Manager.
 - b. Project Record Documents (as-built), including reproducible prints and AutoCAD 2000 format drawings on discs.

- c. Warranties and bonds specified in Individual Sections of the Specifications.
- d. List of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights weekends, and holidays.

7. Certify equipment and systems have been tested in presence of Owner's representative and are operational.
8. Remove temporary facilities and services that are no longer required.
9. Remove mock-ups, field samples and similar items.
10. Complete final cleaning, including repair and restoration, or replacement of damaged Work.
11. Remove surplus materials, rubbish and similar elements.
12. Application for reduction of retainage.
13. Consent of Surety.
14. Advise the Owner of the change-over in security provisions.
15. Final progress photographs.

B. Within reasonable time, Owner's Project Manager will inspect to determine status of completion.

C. Should Owner's Project Manager determine Work is not substantially complete, he will promptly notify Contractor in writing, giving reasons therefore. The Owner's Project Manager's notification will be detailed or general as he deems appropriate to the actual status of completion observed.

D. Contractor shall substantially complete work, and remedy any noted deficiencies, and send a second written notice of Substantial Completion. Owner's Project Manager will reinspect the Work.

E. When Owner's Project Manager determines Work is Substantially Complete, he will prepare AIA Document G704, Certificate of Substantial Completion in accordance with the GENERAL CONDITIONS and Document 00 73 00, MODIFICATIONS TO GENERAL CONDITIONS.

1.04 FINAL ACCEPTANCE

A. Prior to requesting final inspection for certification of Final Acceptance and final payment, complete the following:

1. Submission of final payment request with releases and supporting documentation.
2. Completion of incomplete Work.
3. Assurances that unsettled claims will be settled.
4. Submission of updated final statement, including accounting for final additional changes to the Contract Sum. Show additional Contract Sum, additions and deductions, previous Change Orders, Total Adjusted Contract Sum, previous payments, and Contract Sum due.

5. Submission of consent of surety to Final Payment.
6. Submission of evidence of final, continuing insurance coverage complying with insurance requirements.
7. Prove that taxes, fees, and similar obligations have been paid.
8. Remove temporary facilities and services.
9. Remove surplus materials, rubbish and similar elements.
10. Certify Work has been inspected for compliance with Contract Documents.
11. Certify Work has been completed in accordance with Contract Documents, and deficiencies listed with Certificate of Substantial Completion have been corrected.
12. Certify Work is complete and ready for final inspection.
13. Certify materials incorporated have no asbestos containing materials or lead.
14. Acceptance of Work by the Owner.

B. Owner's Project Manager will inspect to verify status of completion with reasonable promptness.

C. Should Owner's Project Manager consider Work is incomplete or defective, he will promptly notify Contractor in writing, listing incomplete or defective work.

1. Contractor shall take immediate steps to remedy deficiencies and send a second written certification that Work is complete, and Owner's Project Manager will reinspect the work.
2. When Owner's Project Manager finds Work is acceptable, he will consider closeout submittals.
3. Reinspection Fees: Should Owner's Project Manager perform re inspections due to failure of Work to comply with claims made by the Contractor, Owner will compensate Owner's Project Manager for such additional services, and deduct the amount of such compensation from final payment to the Contractor.

D. Application for Final Payment: Submit Application for Final Payment in accordance with procedures and requirements of the GENERAL CONDITIONS, and Document 00 73 00, MODIFICATIONS TO GENERAL CONDITIONS.

1. Owner's Project Manager will issue final Change Order, reflecting approved adjustments to the Contract Sum not previously made by Change Orders.

1.05 RECORD DOCUMENTS

A. General: Maintain a complete set of Record Documents at the site. Do not use Record Documents for construction purposes. Provide access to Record Documents for Owner's Project Manager and Owner's reference. Generally, without limitation, Record Documents shall include the following:

1. Record Drawings: Maintain a clean set of Contract Drawings and shop drawings, updated weekly to show actual installation. Give particular attention to concealed items.

- a. As-Built Drawings: As-built drawings shall be prepared in AutoCAD version 2000 format. Submit to Owner in electronic format designated by Owner; submit hard copies of AutoCAD files on 11x17 sheets.
2. Record Project Manual: Maintain a clean Project Manual, including Addenda, Change Orders, Owner's Project Manager Field Orders, and other modifications, updated weekly to show changes in actual work performed. Give particular attention to substitutions, selection of options, and similar information.
3. Record Product Data: Maintain one copy of each approved Product Data submittal, updated weekly to show changes from products delivered, work performed, and from manufacturer's recommended installation instructions.
4. Record Samples: Maintain one copy of each approved Sample submitted.
5. Record Field Test Reports: Maintain one copy of each Field Test Report.
6. Daily Progress Reports: Maintain one copy of each Daily Progress Report.

B. Maintenance of Documents and Samples: Store documents and samples in Contractor's field office apart from documents used for construction. Provide files and racks for document storage. Provide locked cabinet or secure storage space for storage of samples. File documents and samples in accordance with CSI format. Maintain documents in clean, dry, legible condition and in good order. Do not use Record Documents for construction purposes. Make documents and samples available at all times for inspection by Owner's Project Manager. The fire protection, plumbing, mechanical and electrical trades shall be responsible to the Contractor to keep the record documents for their portions of the work marked currently to record all changes in the work made during construction.

C. Recording: Label each document "PROJECT RECORD" in neat large printed letters. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.

D. Drawings: Legibly update all Drawings to record actual construction, including the following:

1. Field changes of dimension and detail.
2. Changes made by Field Order or Change Order.
3. Details not in original Contract Documents.

E. Specifications and Addenda: Legibly mark each Section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
2. Changes made by Field Order or by Change Order.

F. Submittal: At Contract Closeout, deliver Record Documents to Owner's Project Manager. Accompany submittal with transmittal letter in duplicate, indicating the date, Project title and number, Contractor's name and address, title and number of Record Document, and signature of Contractor or his authorized representative.

1.06 OPERATING AND MAINTENANCE DATA

- A. General: Prepare and submit Operating and Maintenance Data as specified in this Section and referenced in other pertinent Sections of Specifications. Organize Operating and Maintenance Data into suitable sets, bound and indexed. Mark appropriate identification on front and spine of each binder. Include the following types of information:
 1. Emergency instructions.
 2. Spare parts list including prices and recommended quantities to be maintained in storage.
 3. Copies of warranties and bonds.
 4. Approved Test Reports.
 5. Product and Manufacturers Certificates.
- B. Instruct Owner's personnel in maintenance of products and in operation of equipment and systems.
- C. Preparation of data shall be done by personnel trained and experienced in maintenance and operation of described products.
- D. Format of Data: Prepare data in form of instructional manual for use by Owner's personnel. Format shall be 8-1/2 in. x 11 in., 20 pound minimum, white, typed pages. Text shall be manufacturer's printed data, or neatly typewritten. Drawings shall be bound with text, with reinforced punched binder tabs. Fold larger drawings to size of text pages. Provide fly-leaf for each separate product or each piece of operating equipment. Provide typed description of product and major component parts of equipment. Provide indexed tabs.
 1. Binders: Provide commercial quality three-ring binders with durable and cleanable plastic covers, with maximum ring size of 1 inch. When multiple binders are used, correlate the data into related consistent groupings.
 2. Binder Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List title of Project, identity of separate structure as applicable, and identity of general subject matter covered in the manual.
- E. Content of Manual: Neatly typewritten table of contents for each volume, arranged in systematic order, indicating Contractor name and address, and a list of each product, indexed to content of the volume. Provide a separate list with each product, name, address, and telephone number of subcontractor or installer, and local source of supply for parts and replacement.
 1. Provide in each volume a copy of each warranty, bond, and service contract issued.
- F. Submittal of Maintenance and Operating Manual: Submit two copies of preliminary draft of proposed formats and outlines of contents prior to start of Work.
 1. Owner's Project Manager will review draft and return one copy with comments.
 2. Submit one copy of complete data in final form 15 days prior to final inspection or acceptance. Copy will be returned after final inspection or acceptance, with comments.

3. Submit three copies of approved data in final form ten days after final inspection or acceptance.

1.07 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to final inspection or acceptance, fully instruct Owner's designated operating and maintenance personnel in the operation, adjustment and maintenance of products, equipment and systems.
- B. Operating and maintenance manual shall constitute the basis of instruction.
 1. Review contents of manual with personnel in full detail to explain all aspects of operation and maintenance.

1.08 WARRANTIES AND BONDS

- A. General: Assemble warranties, bonds, and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.
- B. Number of Original Signed Copies Required: Two each.
- C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item including, product or work item, firm name, address, and telephone number.
- D. Information Required: Provide the date of beginning of warranty, bond, or service and maintenance contract, and duration of warranty, bond, or service and maintenance contract.
- E. Information for Owner's Personnel: Provide information on the proper procedures in case of failure. Indicate instances which might affect the validity of warranty or bond. Indicate Contractor, name of responsible principal, address, and telephone number.
- F. Form of Submittal: Prepare duplicate packets of 8-1/2 x 11 in., punched sheets for installation in standard three-ring binder. Fold larger sheets to fit into binders.
 1. Cover of Packet: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List the Project title and number, and name of Contractor.
 2. Binders: Bind into commercial quality, three-ring, with durable and cleanable plastic covers.
- G. Time of Submittals: For equipment or component parts of equipment put into service during progress of construction, submit documents within ten days after inspection and acceptance. Otherwise make submittals within ten days after Date of Substantial Completion, and prior to final request for payment.
 1. For items of work where acceptance is delayed materially beyond Date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1.08 MATERIALS AND FINISHES MANUAL

- A. Furnish bound and properly identified manuals for all materials and finishes prior to request for Substantial Completion review.
 - 1. Manuals shall be in 8-1/2 by 11 inch pages and bound in three "D ring" capacity binders with durable plastic covers. Internally subdivide the binder contents with permanent page dividers and logically organized.
 - 2. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.
 - a. Arrange content by section number and systems, process flow, under section numbers and sequence as listed in the Table of Contents of this Project Manual.
 - b. Drawings: Preferable 11 inches in height bound in with text with reinforced punched binder tab. Fold drawings larger than 8-1/2 by 11 inches to size of text pages. Provide a drawing pocket for Drawings larger than 11 by 17 inches larger drawings; locate pocket inside rear cover or bound in with text.
- B. Manuals shall include the following:
 - 1. Product data, with catalog number, size, composition, and color and texture designations for all building products, applied materials, and finishes. Provide information for re-ordering custom manufactured products.
 - 2. Instructions for care and maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
 - 3. Moisture protection and weather exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for Inspections, maintenance, and repair.
 - 4. Additional requirements: As specified in individual specification Sections.

1.09 PEST CONTROL AND INSPECTION REPORT

- A. Engage an experienced, licensed exterminator to make a final inspection and fully rid Project of rodents, insects, and other pests.
 - 1. Prepare and submit report, identify:
 - a. Area or areas which were treated.
 - b. Manufacturer's data including MSDS, special precautions and applications instructions.

1.10 FINAL CLEANING

- A. General: General cleaning during construction operations is specified as Work of Section 01 5000, TEMPORARY FACILITIES AND CONTROLS.

PART 2 PRODUCTS

2.01 CLEANING MATERIALS

- A. General: Provide cleaning materials that will not create hazards to health nor property, and will not damage surfaces or finishes.
- B. Use cleaning materials and methods recommended by manufacturer of surface to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.01 FINAL CLEANING

- A. Employ skilled workers for final cleaning.
- B. Clean and restore general work areas and all adjoining areas, and other work soiled or damaged during installation; replace work damaged beyond successful restoration. Where performance of subsequent work could result in damage to complete unit or element, provide protective covering and other provisions to minimize potential for damage.
- C. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.
- D. Complete the following cleaning operations prior to requesting inspection for Certification of Substantial Completion:
 1. Concrete and masonry shall be cleaned free of all foreign matter. If, in opinion of the Owner's Project Manager, further cleaning of specific areas is required they shall be scrubbed with water or other cleaning agents. Acid cleaners shall not be used, except as may otherwise specifically be permitted in the trade sections.
 2. Metal surfaces, hardware, fixtures, appliances, equipment, and similar items shall be cleaned free of all foreign matter and, if necessary, shall be lightly scrubbed at specific stains with clean water, mild soap, and soft rags, thoroughly rinsed and wiped with clean, soft white rags. Abrasive cleaners shall not be used.
 3. Painted surfaces shall be cleaned free of all foreign matter, and if necessary, shall be lightly scrubbed at specific stains with clean water, mild soap, and soft rags, thoroughly rinsed, and wiped with clean, soft white rags.
 4. Clean site areas of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; rake ground surfaces clean.
- E. Before final completion and Owner-occupancy, inspect sight-exposed interior and exterior surfaces and work areas to verify that Work is clean.

END OF SECTION

01 77 00 - 15

SECTION 01 79 00

DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 1. Demonstration of operation of systems, subsystems, and equipment.
 2. Training in operation and maintenance of systems, subsystems, and equipment.
- B. Related Requirements:
 1. Divisions 2 through 33 Sections for specific requirements for demonstration and training for products in those Sections.

1.02 INFORMATIONAL SUBMITTALS

- A. Make Submittals in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.
- B. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
- C. Qualification Data: For facilitator and instructor.
- D. Attendance Record: For each training module, submit list of participants and length of instruction time.
- E. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.03 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 45 00 QUALITY CONTROL, experienced in operation and maintenance procedures and training.
- C. Pre-instruction Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION. Review methods and procedures related to demonstration and training including, but not limited to, the following:
 1. Inspect and discuss locations and other facilities required for instruction.

2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.04 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Owner's Project Manager.

PART 2 - PRODUCTS

2.01 (NOT USED)

PART 3 - EXECUTION

3.01 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 01 77 00 CLOSEOUT PROCEDURES.
- B. Set up instructional equipment at instruction location.

3.02 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 1. Contractor will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 2. Owner will furnish an instructor to describe Owner's operational philosophy.

END OF SECTION

SECTION 01 91 13

GENERAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes general requirements that apply to implementation of commissioning without regard to specific systems, assemblies, or components.

1.02 DEFINITIONS

- A. BoD: Basis of Design. A document that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
- B. CxA: Commissioning Authority.
- C. Systems, Subsystems, Equipment, and Components: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, equipment, and components.

1.03 COMMISSIONING TEAM

- A. Members Appointed by Contractor(s): Individuals, each having the authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated action. The commissioning team shall consist of, but not be limited to, representatives of Contractor, including Project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the CxA.
- B. Members Appointed by Owner:
 1. CxA: The designated person, company, or entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process.
 2. Representatives of the facility user and operation and maintenance personnel.
 3. Owner's Project Manager and engineering design professionals.

1.04 OWNER'S RESPONSIBILITIES

- A. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities.

1.05 CONTRACTOR'S RESPONSIBILITIES

- A. Contractor shall assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform commissioning process activities including, but not limited to, the following:
 1. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
 2. Cooperate with the CxA for resolution of issues recorded in the Issues Log.
 3. Attend commissioning team meetings held on a variable basis.

4. Integrate and coordinate commissioning process activities with construction schedule.
4. Complete commissioning process with CxA.

1.06 CxA'S RESPONSIBILITIES

- A. Organize and lead the commissioning team.
- B. Convene commissioning team meetings.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION